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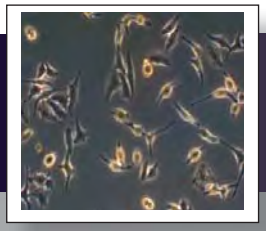
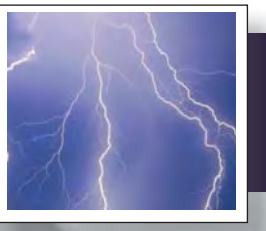


MEDICAL SURVEILLANCE MONTHLY REPORT

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Incident Diagnoses of Cancers and Cancer-related Deaths, Active Component, U.S. Armed Forces, January 2000-December 2009

In the United States, cancers are a major public health concern. The American Cancer Society recently reported that, in the U.S., overall cancer incidence has stabilized over the last decade, and overall cancer mortality has been declining. However, cancer remains one of the five leading causes of death in all age groups among both men and women, and approximately one in four deaths in the U.S. are attributable to cancers.[1]

There have been few studies of cancer incidence in U.S. military populations; and of those, most focused on specific cancers or a single service. Recently, Yamane and colleagues investigated overall cancer incidence in the U.S. Air Force from 1989-2002. Their findings indicated that the incidence of invasive cancers overall had significantly decreased during the 12 year period. Compared to the general U.S. population, standardized incidence ratios for all cancers were lower than expected among male Air Force members (0.50; 95% CI: 0.48 – 0.53) and as expected among females (0.96; 95% CI: 0.89 – 1.03). Standardized incidence ratios of cervical (3.19; 95% CI: 2.74 – 3.70), prostate (1.44; 95% CI: 1.21 – 1.69) and vulvar cancers (3.54; 95% CI: 1.77 – 6.28) were significantly higher.[2] More recently, Zhu and colleagues compared incidence rates of six cancers (lung, colorectal, prostate, breast, testicular and cervical cancer) in active military and civilian populations. As in the Yamane study, cancer incidence among military members was determined using the Department of Defense Automated Central Tumor Registry (ACTUR); cancer incidence among U.S. civilians was estimated using data from the SEER (Surveillance, Epidemiology, and End Results) study of the National Cancer Institute. Compared to the general U.S. population, military members were estimated to have lower incidence rates of colorectal, lung, and cervical cancers and higher rates of prostate and breast cancers.[3]

In 2008, the *MSMR* reported incidence rates of malignant melanoma diagnoses among active component members of the U.S. military.[4] This report extends that analysis by summarizing numbers, rates and trends of incident diagnoses of melanoma and other selected cancers among U.S. military members from 2000 through 2009. In addition, the report enumerates cancer-related deaths among active component military members during the same 10-year surveillance period.

Methods:

The surveillance period was 1 January 2000-31 December 2009. The surveillance population included all individuals who served in the active component of the U.S. Armed

Figure 1. Incident diagnoses of selected cancers, by year and affected anatomic site/cell type, active component, U.S. Armed Forces, 2000-2009

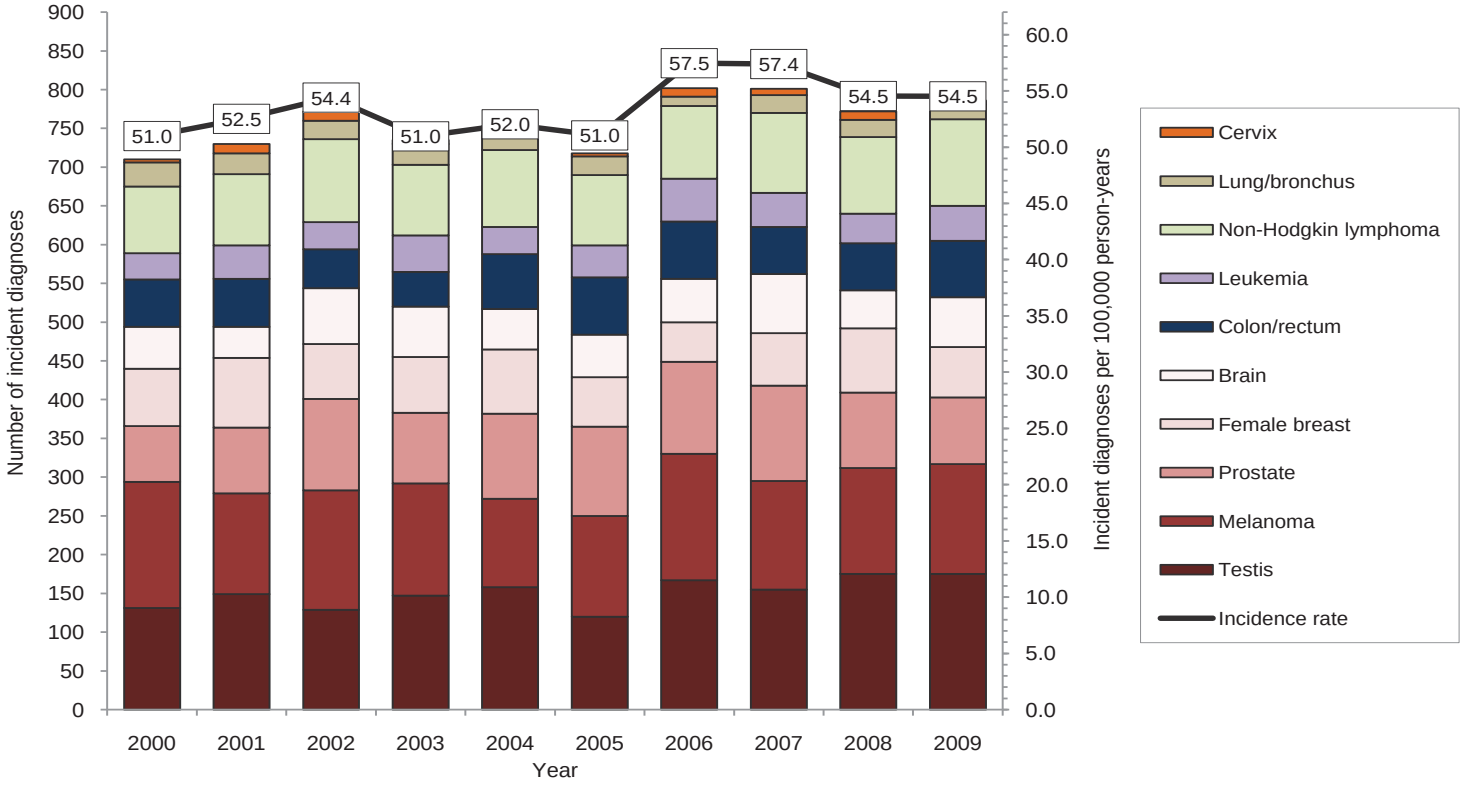


Table 1. Numbers and rates of incident diagnoses of selected cancers, by demographic and military characteristics, active component, U.S. Armed Forces, 2000-2009

	Malignant melanoma			Colorectal			Lung/bronchus			Brain/other central nervous system			Non-Hodgkin lymphoma			Leukemia			Female breast[2]			Cervix[2]			Prostate[2]			Testicle[2]		
	No.	Rate[1]	RR	No.	Rate[1]	RR	No.	Rate[1]	RR	No.	Rate[1]	RR	No.	Rate[1]	RR	No.	Rate[1]	RR	No.	Rate[1]	RR	No.	Rate[1]	RR	No.	Rate[1]	RR	No.	Rate[1]	RR
Total	1,418	10.0		632	4.5		232	1.6		583	4.1		974	6.9		417	2.9		721	35.0		80	3.9		1,016	8.4		1,506	12.4	
Service																														
Army	397	8.0	ref	211	4.2	ref	73	1.5	ref	197	4.0	ref	332	6.7	ref	154	3.1	ref	266	37.0	ref	34	4.7	ref	417	9.8	ref	477	11.2	ref
Navy	386	10.9	1.36	182	5.1	1.21	77	2.2	1.48	137	3.9	0.98	246	6.9	1.04	92	2.6	0.84	162	31.7	0.86	17	3.3	0.70	239	7.9	0.80	382	12.6	1.12
Air Force	517	14.8	1.86	169	4.9	1.14	53	1.5	1.04	163	4.7	1.18	279	8.0	1.20	116	3.3	1.08	261	38.6	1.04	24	3.5	0.75	278	9.9	1.01	381	13.6	1.21
Marine Corps	118	6.5	0.82	44	2.4	0.58	23	1.3	0.87	71	3.9	0.99	92	5.1	0.76	43	2.4	0.77	19	17.3	0.47	2	1.8	0.38	52	3.1	0.31	206	12.2	1.09
Coast Guard	0	0.0	0.00	26	6.7	1.59	6	1.6	1.06	15	3.9	0.98	25	6.5	0.97	12	3.1	1.00	13	29.7	0.80	3	6.9	1.45	30	8.8	0.89	60	17.5	1.56
Sex																														
Male	1,180	9.8	ref	546	4.5	ref	196	1.6	ref	500	4.1	ref	856	7.1	ref	367	3.0	ref	na	na	na	na	na	na	1,016	8.4	na	1,506	12.4	na
Female	238	11.6	1.18	86	4.2	0.93	36	1.7	1.08	83	4.0	0.98	118	5.7	0.81	50	2.4	0.80	721	35.0	na	80	3.9	na	na	na	na	na	na	na
Race/ethnicity																														
White,non-Hispnc	1,311	14.6	ref	409	4.6	ref	151	1.7	ref	441	4.9	ref	625	7.0	ref	271	3.0	ref	358	34.6	ref	49	4.7	ref	599	7.9	ref	1,179	14.9	ref
Black,non-Hispnc	9	0.4	0.02	141	5.6	1.23	47	1.9	1.11	70	2.8	0.56	194	7.7	1.10	56	2.2	0.73	254	42.8	1.24	13	2.2	0.46	305	15.8	2.10	55	2.8	0.19
Other	98	3.6	0.25	82	3.0	0.67	34	1.3	0.75	72	2.7	0.54	155	5.8	0.83	90	3.3	1.11	109	25.4	0.74	18	4.2	0.89	112	4.9	0.66	272	12.0	0.81
Age																														
<20	11	1.0	ref	2	0.2	ref	5	0.5	ref	24	2.2	ref	37	3.4	ref	28	2.6	ref	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	59	6.5	0.00
20-24	162	3.4	3.39	40	0.8	4.60	21	0.4	0.97	136	2.9	1.30	225	4.7	1.40	102	2.2	0.84	19	2.5	ref	5	0.7	ref	1	0.0	ref	417	10.4	ref
25-29	219	7.3	7.21	62	2.1	11.22	19	0.6	1.37	121	4.0	1.82	183	6.1	1.79	63	2.1	0.81	32	6.9	2.71	13	2.8	4.18	5	0.2	24.54	407	16.0	1.53
30-34	220	10.7	10.62	91	4.4	24.14	22	1.1	2.33	98	4.8	2.17	132	6.4	1.89	68	3.3	1.29	98	36.1	14.15	18	7.3	10.95	8	0.4	56.14	290	16.3	1.56
35-39	317	17.3	17.17	133	7.3	39.60	42	2.3	5.00	105	5.7	2.60	167	9.1	2.69	68	3.7	1.45	164	77.3	30.36	27	13.1	19.60	42	2.6	324.83	195	12.1	1.16
40+	489	33.1	32.76	304	20.5	111.90	123	8.3	18.10	99	6.7	3.03	230	15.5	4.57	88	5.9	2.31	408	228.8	89.82	14	7.7	11.56	960	74.1	9,265.18	138	10.6	1.02
Military grade																														
Enlisted	803	6.8	ref	421	3.5	ref	181	1.5	ref	462	3.9	ref	744	6.3	ref	327	2.7	ref	439	25.6	ref	61	3.6	ref	454	4.5	ref	1,216	12.0	ref
Officer/other	705	26.5	3.93	211	9.2	2.60	51	2.2	1.43	121	5.3	1.36	230	10.0	1.60	90	3.9	1.42	282	81.5	3.18	19	5.5	1.54	562	28.0	6.27	290	14.8	1.24
Military occupation																														
Combat	331	11.4	ref	121	4.2	ref	46	1.6	ref	128	4.4	ref	193	6.7	ref	78	2.7	ref	32	24.8	ref	3	2.3	ref	210	7.6	ref	389	14.1	ref
Health care	178	15.3	1.34	60	5.2	1.24	25	2.2	1.35	57	4.9	1.11	111	9.6	1.43	34	2.9	1.09	206	51.9	2.10	13	3.3	1.41	157	20.6	2.71	108	14.1	1.01
Other	909	9.0	0.78	451	4.4	1.06	161	1.6	1.00	398	3.9	0.89	670	6.6	0.99	305	3.0	1.12	483	31.5	1.27	64	4.2	1.80	649	7.5	0.99	1,009	11.7	0.83

[1]Incident diagnoses per 100,000 person-years of military service
[2]For gender-specific cancers, rates as based on person-years of service of the respective gender only

Forces at any time during the surveillance period. For deaths attributed to cancer, the surveillance population included all individuals who served in the active component of the U.S. Army, Navy, Air Force, or Marine Corps during the surveillance period. All data used to determine incident cancer cases were derived from records routinely maintained in the Defense Medical Surveillance System. Deaths of active component service members were ascertained from records produced by Service-specific casualty offices and the Armed Forces Medical Examiner Systems, maintained in the DoD Medical Mortality Registry, and routinely provided for health surveillance purposes to the Armed Forces Health Surveillance Center.

For surveillance purposes, an incident case of malignant melanoma was defined as (a) two or more medical encounters with diagnoses of "malignant melanoma" in the first diagnostic position (ICD-9-CM codes: 172.0-172.9) following at least one medical encounter with a diagnostic procedure commonly used to evaluate clinically suspicious lesions; or (b) five or more medical encounters with diagnoses of "malignant melanoma" in the first diagnostic position (if there are no reported relevant diagnostic procedures). Diagnostic procedure codes indicative of malignant melanoma are listed in a previous *MSMR* report.[4] For other cancer diagnoses, incident cases were defined as one inpatient encounter with a defining diagnosis in the first diagnostic position (or in the second diagnostic position if the first code was a V-code indicating radiotherapy or chemotherapy treatment [ICD-9-CM: V58.0-V58.12]); or three or more outpatient encounters within a 90-day period with the defining diagnosis in the first or second diagnostic position.

The following ICD-9-CM codes were used to define cases of selected cancers by the affected anatomic site or cell type: malignant neoplasm of the colon and rectum: 153.0-154.1, 159.0; malignant neoplasm of the lung and bronchus: 162.2-162.9; malignant neoplasm of the female breast: 174.0- 174.9; cervical cancer: 180.0-180.9; prostate cancer: 185; malignant neoplasm of testis: 186.0-186.9; non-Hodgkin lymphoma: 200.0-200.8, 202.0-202.2, 202.8-202.9; leukemia: 204.0-208.9. Summaries of cancer-related deaths include a category of "other." The "other" category included all sites of cancers that accounted for fewer than 45 deaths during the 10-year period: gastrointestinal (n=41), head and neck (n=39), urinary (n=38), bone (n=23), Hodgkin lymphoma (n=15), testicle (n=17), mesothelium (n=16), prostate (n=9), and cervical and other gynecologic (n=10) (data not shown).

For surveillance purposes, incident dates of cancer diagnoses were the dates of the first medical encounters of affected individuals that included case-defining diagnoses. Individuals could be counted as incident cancer cases only once during the surveillance period (even if cases had diagnoses of more than one cancer type, recurrences of previously treated cancers, or metastatic lesions of primary cancers). Military members with case-defining cancer diagnoses prior to the start of the surveillance period were excluded from the analysis because they were not considered at risk of incident

Figure 2a. Incidence rates of selected cancers in males, active component, U.S. Armed Forces, January 2000-December 2009

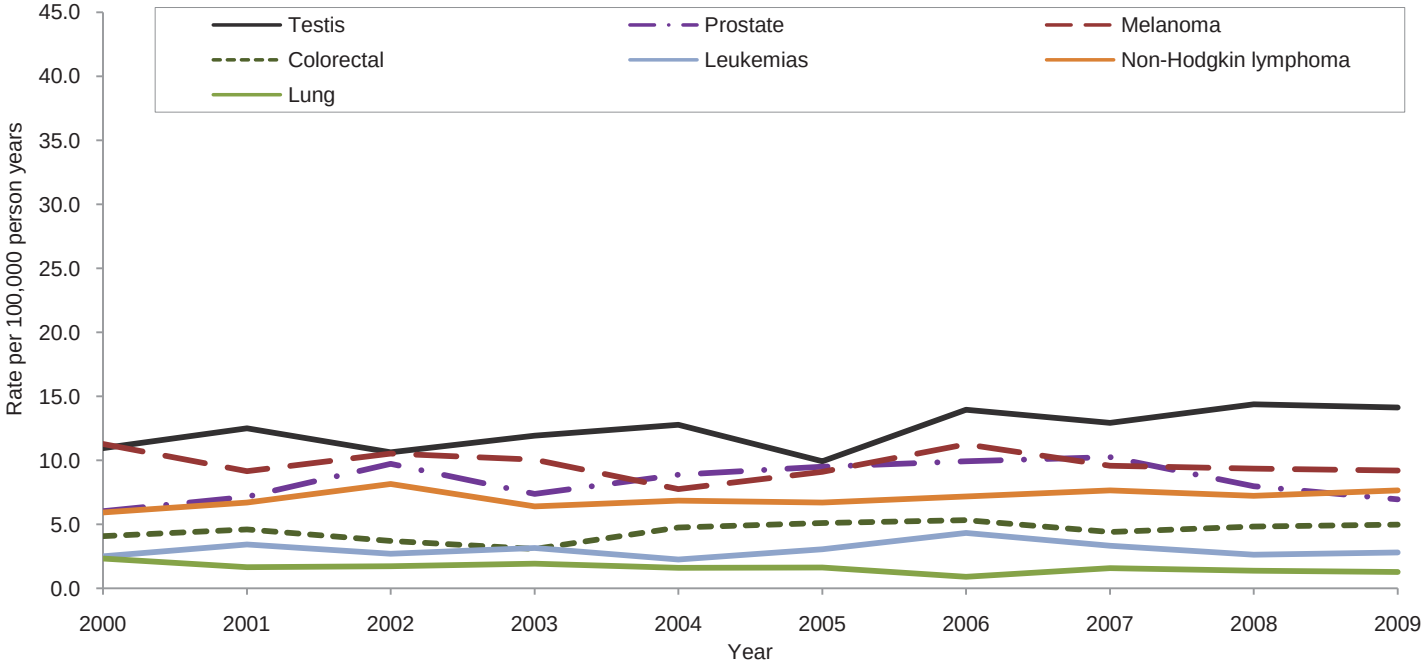
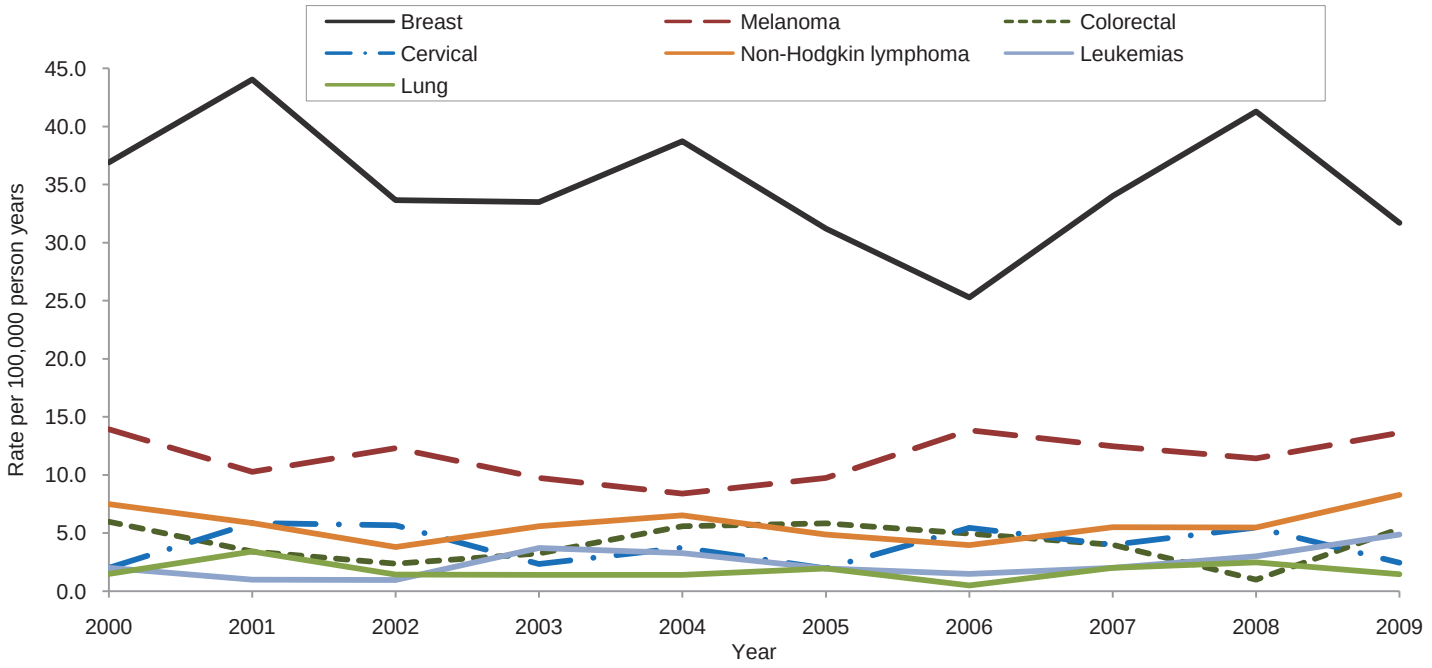


Figure 2b. Incidence rates of selected cancers in females, active component, U.S. Armed Forces, January 2000-December 2009



(first ever) cancer diagnoses during the period. All cancer-related deaths that occurred during the surveillance period were included for this report (even if the related cancers were diagnosed before the beginning of the period).

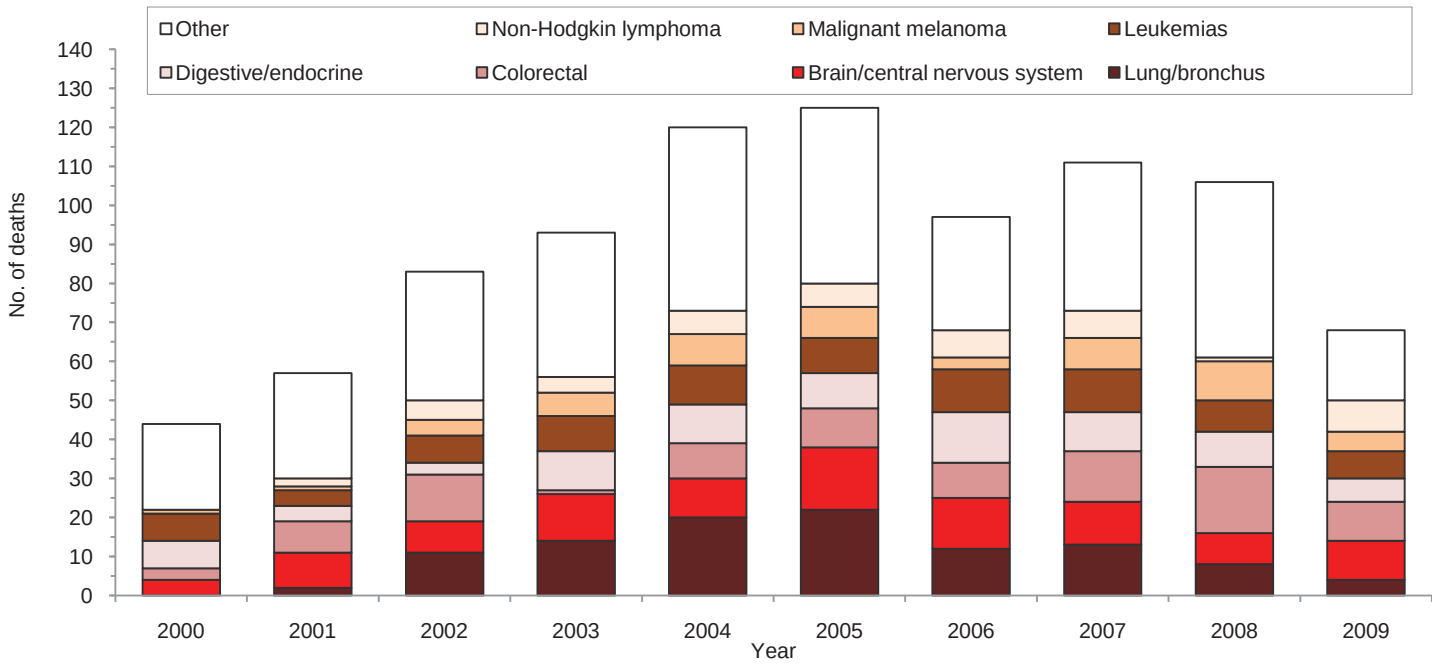
Results:

During the 10-year surveillance period, 7,579 active component members were diagnosed with at least one of the cancers of interest for this report. The mean annual number of incident diagnoses of the subject cancers was 758; the range was 710 in 2000 to 802 in 2006 **(Figure 1).**

Over the 10-year period, the crude rate of incident diagnoses of the subject cancers was 53.6 per 100,000 person-years (p-yrs); the lowest annual incidence rates were 51.0 per 100,000 p-yrs in 2000, 2003, and 2005; and the highest annual incidence rate was 57.5 per 100,000 p-yrs in 2006 **(Figure 1).**

From January 2000 through December 2009, the numbers of incident diagnoses of non-gender-specific cancers were malignant melanoma (n=1,418), non-Hodgkin lymphoma (n=974), colorectal cancer (n=632), brain cancer (n=583),

Figure 3. Cancer-related deaths by year and affected anatomic site/cell type, active component, U.S. Armed Forces, 2000-2009



leukemia (n=417), and cancer of the lung/bronchus (n=232). Among males, the most frequent cancer diagnoses were testicular cancer (n=1,506), malignant melanoma (n=1,180), and prostate cancer (n=1,016); among females, the most frequent cancer diagnoses were breast cancer (n=721), malignant melanoma (n=238), and non-Hodgkin lymphoma (n=118) **(Table 1, Figure 1).** There were no clear trends of increasing or decreasing cancer diagnosis incidence – of specific sites or overall **(Figures 1, 2a, 2b).**

In general, the strongest demographic correlate of increased risk of a cancer diagnosis was older age. For example, for all cancer sites except of the cervix and testicle, the highest rates of diagnoses were among those older than 40 years **(Table 1).** Compared to the other services, the Marine Corps had generally lower incidence of all cancers surveyed (except testicular cancer). Military members in health care occupations had relatively high rates of diagnoses of several cancers, particularly prostate cancer (relative rate [RR] vs other noncombat: 2.73), malignant melanoma (RR vs other noncombat: 1.71), and cancer of the female breast (RR vs other noncombat: 1.71) (Table 1).

Consistent with published literature, the incidence rate for prostate cancer in black males was about twice that observed in white males; however, black males had much lower crude incidence rates of testicular cancer than other race/ethnic groups. As previously reported,[4] white, non-Hispanics had a higher crude rate of malignant melanoma than their counterparts **(Table 1).**

During the period, 904 deaths (mean, per year: 90) of active component service members were attributed to cancers. The number of cancer-related deaths per year markedly varied during the period; the fewest and most deaths per year were in 2000 (n=44) and 2005 (n=125). The cancers (by affected organ system or cell) that caused the most deaths during the period were lung/bronchus (n=106), brain/other central nervous system (n=101), and colon/rectum (n=92) **(Figure 3).**

Editorial comment:

Over the past 10 years, rates of diagnoses of the cancers of interest for this report have been stable among active component members of the U.S. military.

There are limitations to the analyses that should be considered when interpreting the results. For example, for this report, cancer cases were ascertained from ICD-9-CM coded diagnoses reported on standardized records of hospitalizations and outpatient medical encounters. Cancer diagnoses were not confirmed with pathology reports or records in cancer registries (as was done to ascertain cases for some previous studies in military populations). As a result, some cancer-specific diagnoses considered case-defining for this report may reflect erroneous or miscoded diagnoses (e.g., some "rule out" or suspected cases may have been reported with cancer-specific codes). Because of this potential lack of specificity of cancer diagnoses, cancer cases reported herein may overestimate the actual numbers of cancers definitively diagnosed among active component military members during the surveillance period. On the other hand, while ACTUR (the DoD tumor registry) and SEER (a U.S. population based cancer registry managed by the National Cancer Institute) are considered gold standards for cancer case identification in the United States, cases that are registered likely underestimate the total of all cancers that affect the populations of interest.

Interpretations of the findings of various population-based cancer studies should consider the likely completeness and accuracy of case ascertainment.

In this regard, the Defense Medical Surveillance System (DMSS) contains records of nearly all medical encounters of active component military members in "fixed" (i.e., not deployable or at sea) military and non-military medical treatment facilities. The use of administrative medical records to conduct and enhance cancer surveillance has been extensively studied. In general, the ability of administrative medical records to identify incident cases of cancers has been good, depending on the types of cancers examined and definitions used for case ascertainment. For example, estimates of incidence rates of lung, breast, and colon cancers using administrative data were found to be within six percent of the respective incidence rates that were estimated using SEER data.[5-8]

An important determinant of the quality of health surveillance in general is the completeness and accuracy of case-finding. In turn, the criteria used to detect and categorize cases for surveillance purposes (e.g., as possible, likely, or confirmed cases) significantly impact counts of cases of specific conditions and surveillance findings and their implications in general. To inform our selection of cancer case definitions, we reviewed several case finding algorithms before deciding on the case definitions used for this report.

Active component military populations differ from the U.S. civilian population in many ways. Several factors that differ in the populations affect both the incidence of and mortality from cancers. For example, the incidence rates of many cancers increase with age, and many behavioral factors are associated with cancer risk including tobacco smoking, food and alcohol consumption, physical exercise, medication use, infectious disease experience, history of sun exposure, and so on. In general, the U.S. military population is younger and healthier than their civilian counterparts. All applicants for military service are medically examined before induction, and those with specified medical conditions (e.g., prevalent cancers, HIV-1 infections) are disqualified. In addition, all military services have height, weight, and physical fitness standards; as a result, obesity and sedentary life styles (which are correlates of risk for some cancers) are not common among active military members. Military members have unlimited access to health care at no cost to themselves; in addition, they are required to undergo special and periodic medical examinations that may include cancer screening examinations such as mammography, prostate specific antigen (PSA) testing, cytological examination of the cervix (Papanicolaou smear), and so on. Because military members may seek care for signs or symptoms of cancers at early clinical stages and are subject to relatively intensive medical screening, cancers may be detected earlier in their clinical courses in military than in civilian populations. If so, rates of cancer diagnoses may be higher among military members than similarly aged civilians (because they are detected earlier); however, the detection and treatment of cancers at earlier stages may decrease cancer-related mortality among military members compared to civilians.

Interpretations of temporal trends of rates of cancer diagnoses should consider not only changes in screening practices but also changes in behavioral risk factors in relation to the clinical latencies of cancers of interest. For example, cigarette smoking is a significant risk factor for several cancers. While the U.S. military discourages cigarette smoking by its members and prohibits smoking in some settings, smoking prevalence remains higher among military members (31%) than in the general U.S. population (20%).[9,10] This report documented a low incidence of lung cancers among military members; however, the finding may reflect the long latency of smoking-related lung cancer; lung cancer cases related to current tobacco smoking may not be clinically apparent until affected members leave active service. Unquestionably, smoking cessation should be a high priority for all military health care and public health practitioners.

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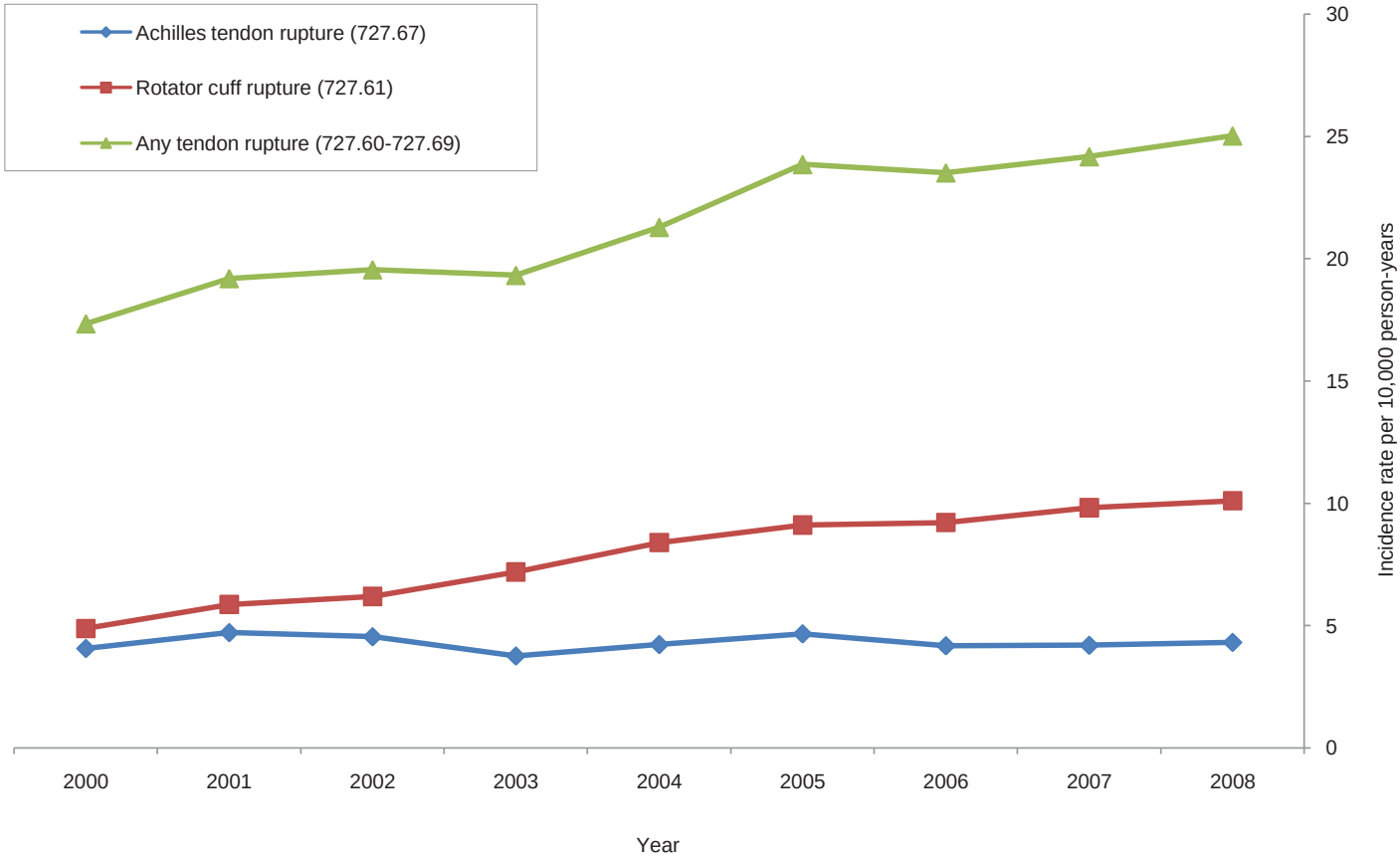
In the next MSMR: Tendon ruptures

Incidence rates of tendon rupture, by type and year, active component, U.S. Armed Forces, 2000-2008



Brief Report: Japanese Encephalitis Surveillance Among Beneficiaries of the U.S. Military Health System, 2000-2009

Japanese encephalitis (JE) was first recognized as a distinct clinical entity during outbreaks in Japan in the 1870s. JE is now the leading cause of arboviral encephalitis worldwide and of viral neurological disease and disability in Asia. JE is operationally important to the U.S. military because of its endemicity throughout the Pacific region.[1,2]

Approximately 1 in 25 to 1 in 1,000 humans infected with Japanese encephalitis virus (JEV) develop clinical features of infection; in symptomatic individuals, the clinical picture may rapidly progress from an undifferentiated febrile illness to encephalitis resulting in permanent neurologic deficits or death.[3,4] Nearly one-third of JE cases result in death, and approximately one-half of survivors have permanent neurologic, cognitive, or psychiatric sequelae.[5] Approximately 30-50,000 cases and 10-15,000 deaths from JE are reported to the World Health Organization annually.[6]

Transmission of JEV can occur when amplifying hosts (e.g., domestic pigs, wading birds) are in proximity to breeding locations of the *Culex* mosquito vectors (e.g., flooded rice fields).[7] Transmission to humans typically occurs in agricultural areas with high concentrations of both animal hosts and mosquito vectors—with the bulk of morbidity, mortality, and long-term disability from JE occuring in rural communities in Southeast Asia and the Western Pacific.[8] There are no curative treatments for JE; therapy consists of supportive care.

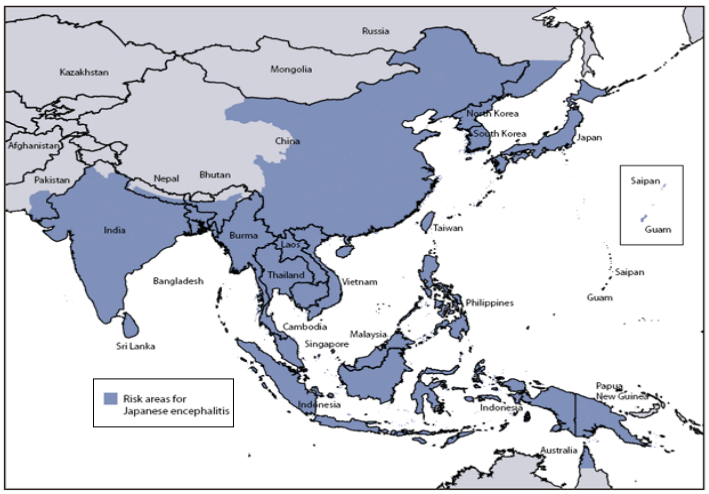
Over decades, U.S. military medical researchers have made significant contributions to the control of JE, including characterization of the ecology of JEV, development of first and second generation vaccines and diagnostic assays, conduct of vaccine safety and efficacy trials, and advocacy for U.S. licensure of JE vaccines.[9] During World War II, LTC Albert Sabin conducted pioneering work in the development of a JE vaccine. In 1992, an inactivated Japanese encephalitis vaccine (BIKEN/JE-Vax) made in mouse brains was licensed for use in the U.S. In 2005, production of JE-Vax ceased in the wake of reports of moderate to severe hypersensitivity and neurologic reactions temporally associated with vaccination.[10-13] The DoD has maintained a stockpile of JE-Vax with an expiration data of May 2011. In 2009, a purified, inactivated JE vaccine (IXIARO) that was developed at the Walter Reed Army Institute of Research (WRAIR) was licensed in the U.S. for use in individuals at least 17 years of age; beginning in 2010, this vaccine has been administered to U.S. military members who are assigned to JE endemic countries. Another second-generation vaccine, ChimeriVax-JE is undergoing the licensure process in Australia and Thailand.[14]

Epidemics of JE among U.S. military members were reported in World War II, the Korean War, and the Vietnam conflict; cases of JE in unvaccinated military members have been reported as recently as the mid-1980s in the Philippines (n=2) and 1991 in Okinawa (n=3).[15] The waning availability of JE-Vax, the improved safety profile of second-generation vaccines, and the geographic spread of JE virus over the past 50 years warrant continued surveillance of JE among U.S. military members and other beneficiaries of the U.S. Military Health System (MHS). This report summarizes the descriptive epidemiology of Japanese encephalitis during the past 10 years among U.S. military members, their family members, and other beneficiaries of the MHS.

Methods:

The surveillance period was 1 January 2000 to 31 December 2009. Data reflecting notifiable medical event reports, hospitalizations, outpatient health care encounters, and the administration of immunizations were derived from records routinely provided to the Armed Forces Health Surveillance Center (AFHSC) and maintained in the Defense Medical Surveillance System (DMSS) for health surveillance purposes. The surveillance population included all beneficiaries of the Military Health System with documented medical encounters at U.S. military treatment facilities or non-military facilities that are reimbursed through the MHS. For this analysis, possible

Figure 1. Approximate geographic range of Japanese encephalitis



Source: Fischer M, Griggs A, Staples J. Japanese encephalitis. In: Brunette G, ed. Health information for international travel 2010. Atlanta: US Department of Health and Human Services, Public Health Service; 2009:75. [MMWR]

Japanese encephalitis (JE) cases were ascertained based on inpatient and outpatient encounters with a primary (first-listed) diagnosis of JE (ICD-9-CM: 062.0) and reportable medical events of "mosquito-borne encephalitis" (ICD-9-CM: 062).[16] Because specific diagnoses of JE cannot be identified by the non-specific ICD-9 diagnostic code (062) that is used to report JE as a notifiable event, each reported case of "mosquito-borne encephalitis" was reviewed. For this summary, notifiable event reports of "mosquito-borne encephalitis" were considered JE cases if they included a history of travel in a JE endemic country **(Figure 1)** and/or comments that specified the diagnosis as JE.

For active component military members, ambulatory encounters with JE-specific diagnoses were compared with the immunization histories of the subject individuals. Any such ambulatory encounters that occurred within seven days before or after vaccination for JE (indicated by immunization type code 039 "Japanese encephalitis vaccine" or 134 "Japanese encephalitis-intramuscular") were considered immunization-related encounters that had been miscoded as cases of JE disease.

The geographic distribution of JE-related medical encounters was determined based on the Defense Medical Information System Identifier (DMIS ID) that was associated with each relevant health care record.

Results:

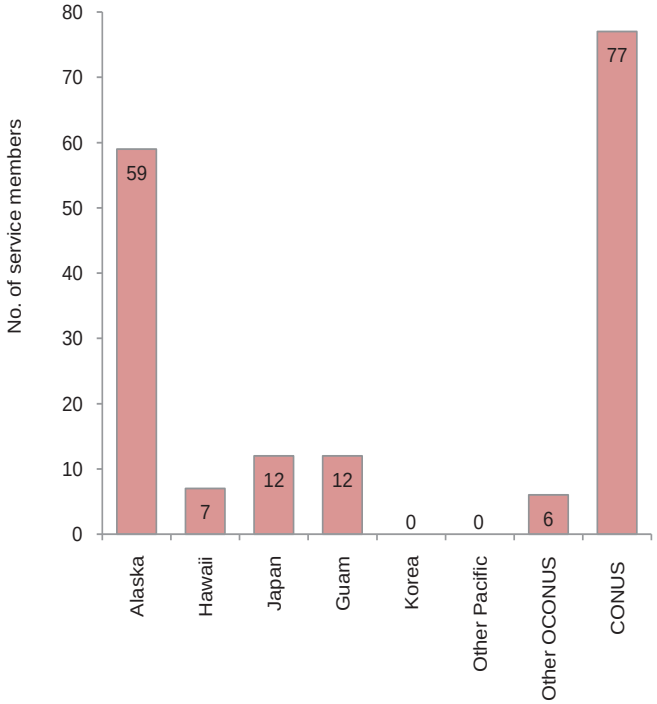
During the past 10 years, there were no hospitalizations of MHS beneficiaries with primary discharge diagnoses of Japanese encephalitis (ICD-9: 062.0) **(Table 1).** There were 48 notifiable medical event reports of "encephalitis, mosquito-borne" (ICD-9: 062) during the period, of which, only 14 mentioned a specific infectious agent. None of the notifiable medical event reports included specific diagnoses of JE or histories of travel to JE endemic countries; however, two reports of mosquito-borne viral encephalitis were from treatment facilities in JE endemic countries: Okinawa and Guam **(Table 1).**

During the 10-year period, there were 747 active component service members with primary (first-listed) diagnoses of JE during an ambulatory encounter; of these individuals, more than three-fourths (n=574, 77%) received a JE vaccination within 7 days of the JE-coded ambulatory encounter. Thus, in the past 10 years, 173 active component members had ambulatory encounters with primary diagnoses of JE that were not temporally associated with hospitalizations, notifiable medical event reports or documented JE vaccinations (data not shown).

Table 1. Hospitalizations and reports of Japanese encephalitis, 2000-2009

	Reportable medical events	Hospitalizations
Japanese encephalitis (ICD-9-CM:062.0)	0	0
Encephalitis, mosquito-borne (ICD-9-CM:062)	48	n/a
Encephalitis, mosquito-borne, reports from endemic countries	2	0

Figure 2. Geographic distribution of outpatient "cases" of Japanese encephalitis (JE), among individuals with diagnoses not temporally associated (+/- 7 days) with JE vaccination, active component, U.S. Armed Forces, 2000-2009



Of the 173 active component service members with outpatient diagnoses of JE not temporally associated with vaccination, 45% (n=77) were diagnosed in medical facilities in the continental United States **(Figure 2).** Most of the remaining service members received diagnoses in areas outside the geographic range of JE, e.g., Alaska (n=59), Hawaii (n=7). Of note, relatively few service members with JE-related outpatient encounters were diagnosed in facilities in JE endemic areas, e.g., Japan (n=12), Guam (n=12), Korea (n=0) **(Figure 2).**

Editorial comment:

During the past 10 years, among Military Health System beneficiaries, there were no hospitalizations reported as due to Japanese encephalitis, and no hospitalizations in the Pacific region reported as due to arboviral encephalitides. Medical encounter data available during the past 20 years yield only the three cases among Marines hospitalized in Okinawa (as described in Saito et al).[15] Because reporting of notifiable medical events and ambulatory visits did not begin until the mid 1990s, comprehensive surveillance of JE during

the past 20 years is not possible using DMSS. However, the available surveillance data and the published literature on JE suggest that there has not been a hospitalized case of JE among Military Health System beneficiaries since 1991.

Since 2000, among active component service members, there were 173 service members who received outpatient diagnoses of JE (without documented vaccination against JE virus within 7 days of the diagnosis). Given the serious clinical nature of JE, it is very unlikely that a "true case" would be diagnosed and clinically managed in the outpatient setting only; these "cases" are likely miscoded medical encounters for JE immunizations, adverse reactions to JE vaccine, or personal prevention counseling before military assignments or personal travel to JE endemic areas. In summary, despite the frequency with which the administrative medical records contain ICD-9 codes indicative of cases of JE, it appears highly likely that there have been no recognized cases of JE disease in the MHS beneficiary population during the last 10 years.

As with surveillance of other vaccine-preventable diseases of military importance, the recent absence of cases and deaths of JE does not imply that the threat has been eliminated. Some countries, such as Singapore, in the endemic regions of Asia have been successful at reducing their burdens of JE. In general, however, the JE virus has continued to spread geographically over the past 50 years. Public health control measures that are useful to counter the threat of JE include mass vaccination of children, use of pesticides, improved pig-rearing practices, separation of housing from farming, improved housing with air conditioning, and elimination of mosquito breeding pools.[1]

The emergence of endemic West Nile Virus in the Americas in 1999 provides a striking illustration of the clinical and epidemiologic expressions of another Flavivirus infection, the presence of and potential threat posed by *Culex* mosquitoes in the U.S., and the ability of arboviruses to become established in competent zoonotic hosts. Because of its unique ecological niche and life cycle, JE is not a threat to the mainland of the United States; however, JE continues to be a significant threat to military units that operate in proximity to rice fields and amplifying hosts in JE endemic areas. Attack rates for nonimmunized Western military personnel exposed during field operations in Asia between 1945 and 1991 were estimated as 0.05 to 2.1 per 10,000 per week.[1] In summary, the lack of specific antiviral treatment, the high case-fatality ratio (up to 30%), and the potentially severe and permanent clinical effects of JE make prevention (e.g., elimination of mosquito habitats, personal protective measures against mosquito bites, immunizations) a high force health protection priority.

The results of this report should be interpreted with consideration of several significant limitations. For example, for this report, case ascertainment was based on specific diagnoses of JE that were coded and reported on administrative medical records and non-specific diagnoses of "mosquito-borne viral encephalitis" that were reported as notifiable medical events. The relatively high number of JE diagnostic codes during ambulatory encounters outside of JE endemic areas (e.g., continental U.S.) and the close temporal association between ambulatory encounters with diagnoses of JE and vaccinations against JE strongly suggest that, during the last 10 years, most (perhaps all) diagnoses of JE in ambulatory settings were miscoded and not indicative of actual JE cases. In addition, the ascertainment of JE cases from notifiable medical event reports is difficult because diagnoses are not specific and exposure histories (e.g., travel to or residence in endemic areas) may not be complete. In general, the lack of confirmatory laboratory data in medical administrative records that are included in the DMSS significantly limits the completeness and accuracy of surveillance findings regarding diseases that require serologic diagnosis.

Besides the U.S. military, Japanese encephalitis remains cause for concern and continued attention of the World Health Organization, the pharmaceutical industry, and humanitarian organizations. For U.S. military members, their families, and other beneficiaries of the MHS, the new generation of JE vaccines offers safe and effective protection against JE when living and travelling in endemic areas, particularly when vaccination is combined with personal protective measures against mosquito bites (e.g., proper wear of permethrin-impregnated uniforms and clothing, bed nets, DEET-containing insect repellent).[5]

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Correction

In the malaria update published in January 2010 (MSMR Vol. 17 No. 1), it was stated on pages 3 and 4 that the number of malaria cases reported as *P. falciparum* was higher in 2009 than in any of the prior eight years. This is incorrect. While the percent of malaria cases reported as *P. falciparum* in 2009 (42%) was by far the highest of the eight-year surveillance period, the number of *P. falciparum* cases in 2009 (n=25) was the second highest of the period, after 2003 (n=38).

Surveillance Snapshot: Lightning-related medical encounters, 2009-2010

According to the National Weather Service, an average of 400 people are struck by lightning (of whom 58 die) each year in the United States. To date this year, there have been 11 lightning-related deaths in the United States.

Since January 2009, 42 active component service members have had documented lightning-related medical encounters (Figure 1); two of the affected service members were hospitalized. Most (90%) active component members affected by lightning in the past 18 months were in the Army (n=29) or Air Force (n=9) (Figure 1). Since January of this year, seven U.S. service members have had lightning-related medical encounters (including three Air Force members who were injured by a single strike in Florida in February) (Figure 1).

In the past 18 months, lightning-related injuries of U.S. military members were reported from 23 different medical facilities throughout the continental U.S. (n=37), Korea (n=3), and Japan (Okinawa, n=2). Two-thirds of all cases were reported from facilities in Georgia (n=15), Colorado (n=6), Florida (n=4), and Texas (n=3) (Figure 2); of note, 13 cases were reported from a single location (Fort Benning, GA).

Summer is the peak season for lightning-related encounters due to the increase in thunderstorms and outdoor activity. The National Weather Service recommends seeking refuge in a large indoor shelter or a fully enclosed vehicle — from the first sound of thunder until 30 minutes after the last clap.

Figure 1. Incident lightning-related medical encounters (ICD-9-CM: 994.0 "effects of lightning" or E907 "accident caused by lightning" in any diagnostic position), by month and service, active component, U.S. Armed Forces, January 2009-June 2010

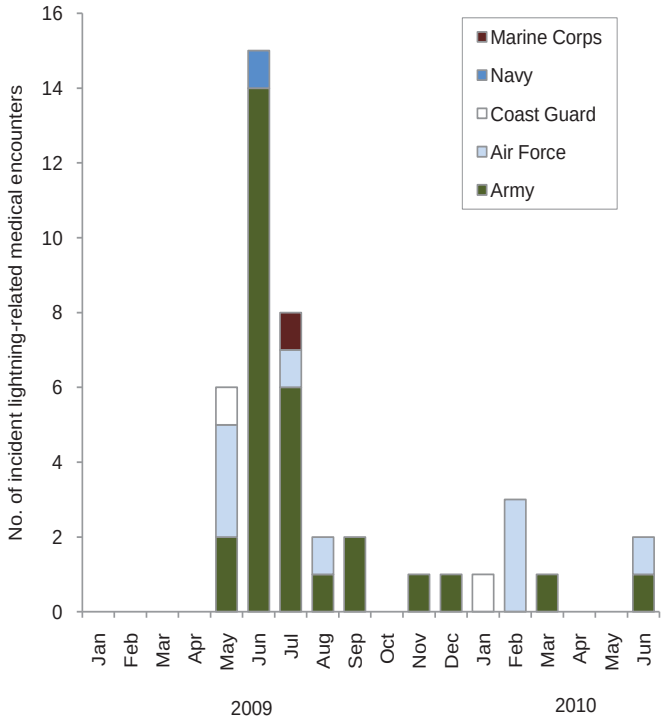
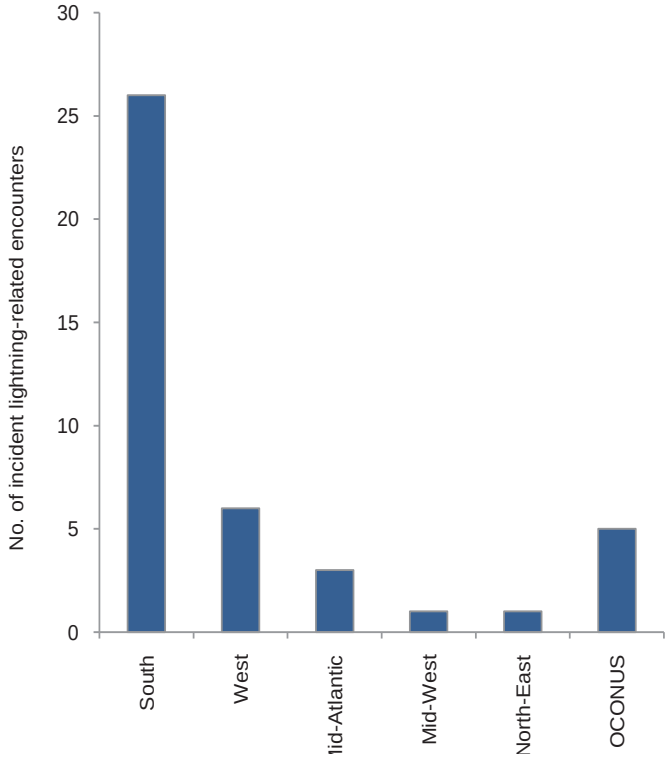
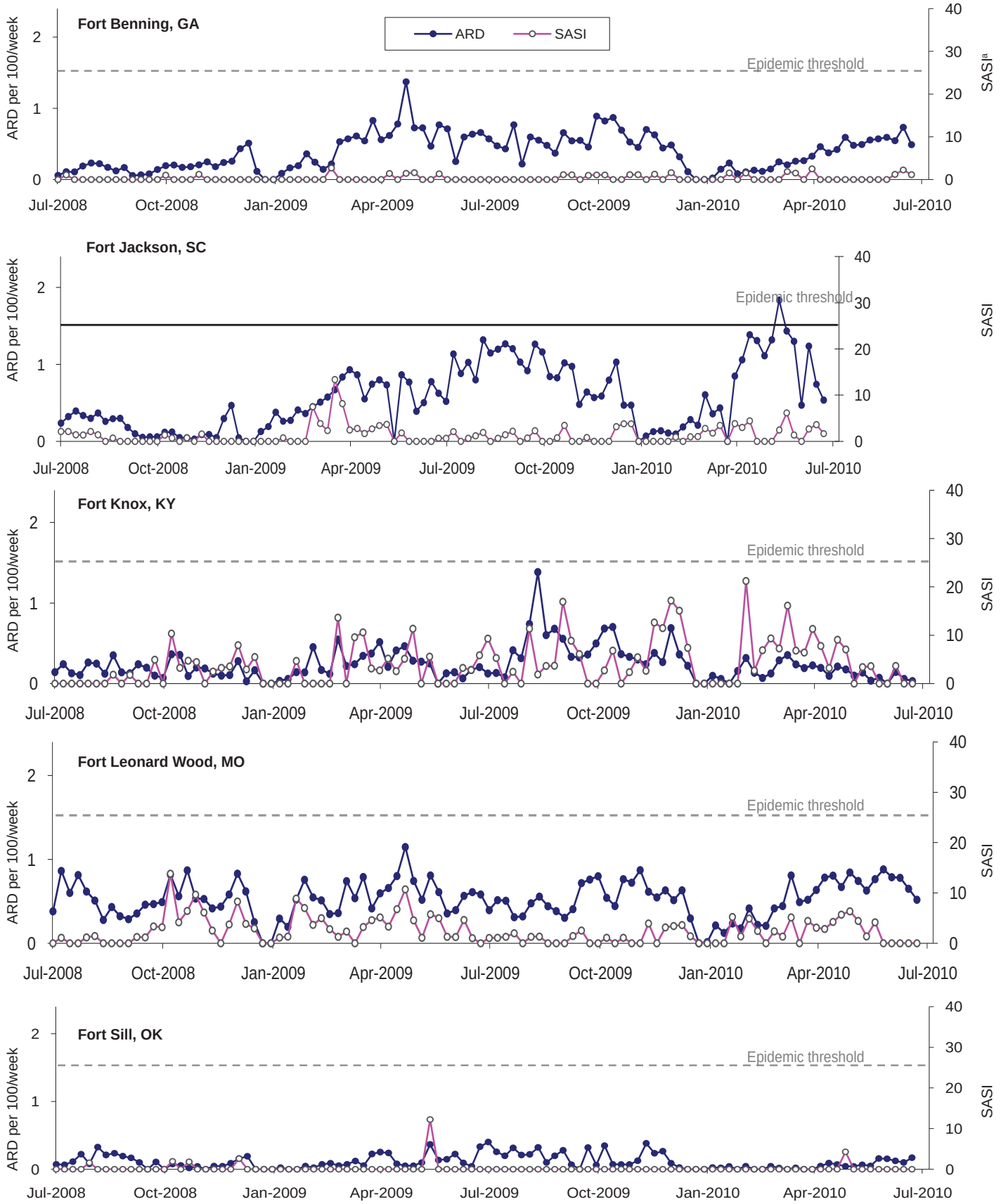


Figure 2. Lightning-related medical encounters, by geographic region of reporting medical facility, January 2009-June 2010



Acute respiratory disease (ARD) and streptococcal pharyngitis rates (SASI[a]), basic combat training centers, U.S. Army, by week, July 2008-July 2010



[a]Streptococcal-ARD surveillance index (SASI) = ARD rate x % positive culture for group A streptococcus
ARD rate = cases per 100 trainees per week
ARD rate > 1.5 or SASI > 25.0 for 2 consecutive weeks are surveillance indicators of epidemics

Update: Deployment Health Assessments, U.S. Armed Forces, May 2010

In April 2010, there were lower numbers of deployment health pre- and post-deployment health assessment forms transmitted to the Armed Forcces Health Surveillance Center than at any time during the past seven years **(Table 1, Figure 1)** . Since January 2003, peaks and troughs in the numbers of pre- and post-deployment health assessment forms transmitted generally corresponded to times of departure and return of large numbers of deployers. The numbers of post-deployment health reassessments (PDHRA) transmitted in May 2010 were the lowest in the past four years. Between April 2006 and March 2010, the number of forms per month ranged from 17,000 to 43,000 **(Table 1, Figure 1).**

During the past 12 months, the proportions of returned deployers who rated their health as "fair" or "poor" were 9-11% on post-deployment health assessment questionnaires and 10-14% on PDHRA questionnaires **(Figure 2).**

In general, on post-deployment assessments and reassessments, deployers in the Army and in reserve components were more likely than their respective counterparts to report health and exposure-related concerns **(Table 2, Figure 2).** Both active and reserve component members were more likely to report exposure concerns three to six months after compared to the time of return from deployment **(Figure 3).**

At the time of return from deployment, soldiers serving in the active component were the most likely of all deployers to receive mental health referrals; however, three to six months after returning, active component soldiers were less likely than Army Reservists to receive mental health referrals **(Table 2).**

Finally, during the past three years, reserve component members have been more likely than active to report "exposure concerns" on post-deployment assessments and reassessments **(Figure 3).**

Table 1. Deployment-related health assessment forms, by month, U.S. Armed Forces, June 2009-May 2010

	Pre-deployment assessment DD2795		Post-deployment assessment DD2796		Post-deployment reassessment DD2900	
	No.	%	No.	%	No.	%
Total	**441,523**	**100**	**416,684**	**100**	**305,667**	**100**
2009						
June	44,515	10.1	28,805	6.9	26,995	8.8
July	40,072	9.1	28,777	6.9	22,759	7.4
August	39,267	8.9	46,769	11.2	21,777	7.1
September	30,604	6.9	39,607	9.5	26,253	8.6
October	36,428	8.3	32,447	7.8	24,071	7.9
November	32,219	7.3	32,884	7.9	20,629	6.7
December	30,859	7.0	36,520	8.8	29,035	9.5
2010						
January	55,316	12.5	34,177	8.2	25,693	8.4
February	31,285	7.1	27,656	6.6	26,889	8.8
March	32,379	7.3	44,371	10.6	35,508	11.6
April	31,601	7.2	32,216	7.7	24,383	8.0
May	36,978	8.4	32,455	7.8	21,675	7.1

Figure 2. Proportion of deployment health assessment forms with self-assessed health status as "fair" or "poor", U.S. Armed Forces, June 2009-May 2010

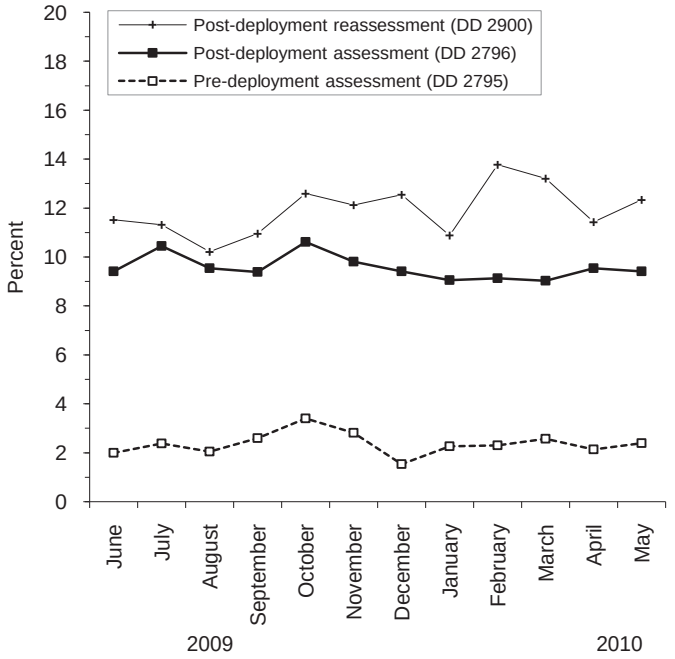


Figure 1. Total deployment health assessment and reassessment forms, by month, U.S. Armed Forces, January 2003-May 2010

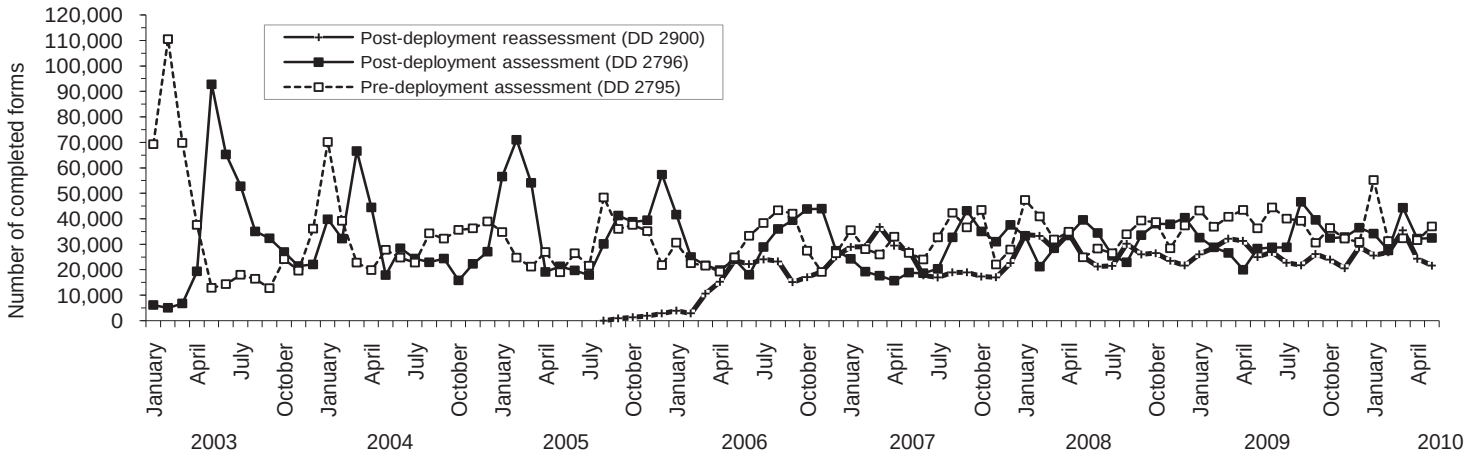


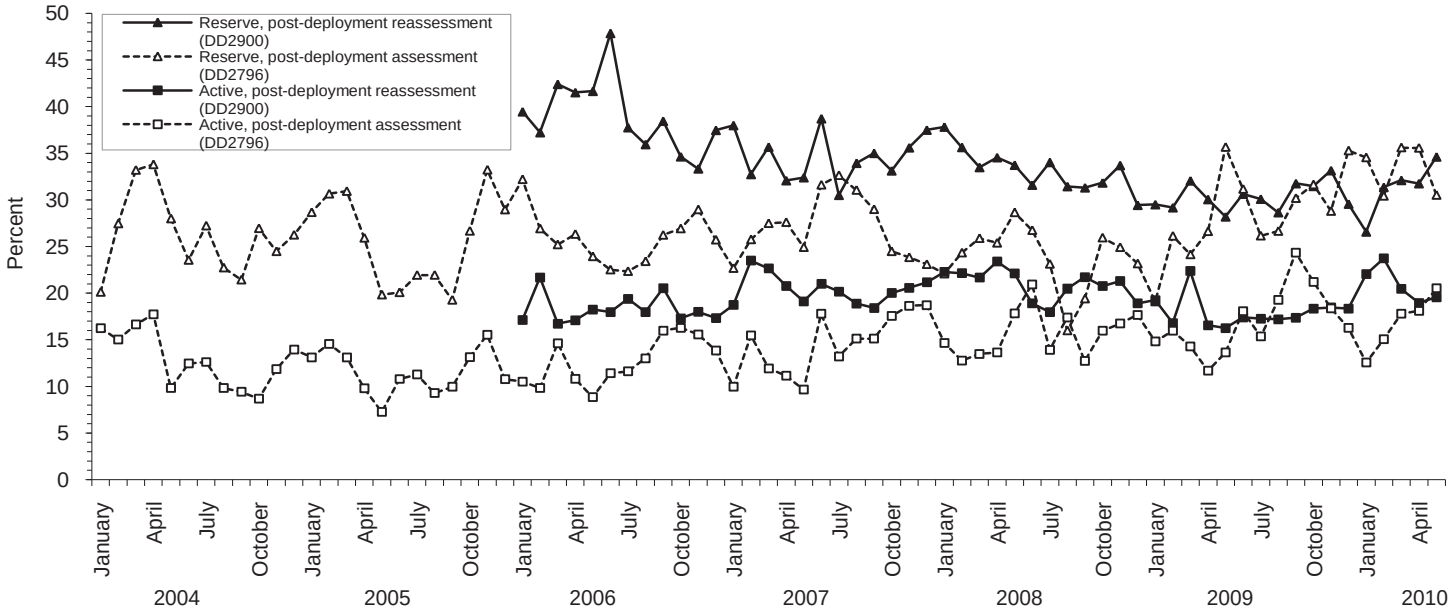
Table 2. Percentage of service members who endorsed selected questions/received referrals on health assessment forms, U.S. Armed Forces, June 2009-May 2010

	Army			Navy			Air Force			Marine Corps			All service members		
Active component	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900
	n= 162,493	n= 135,302	n= 118,837	n= 20,490	n= 14,665	n= 13,738	n= 60,034	n= 53,217	n= 50,484	n= 33,378	n= 27,277	n= 34,748	n= 276,395	n= 230,461	n= 17,807
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
General health "fair" or "poor"	3.8	10.3	15.0	1.3	4.7	6.0	0.4	3.4	4.1	1.4	7.0	9.8	2.6	8.0	11.1
Health concerns, not wound or injury	19.8	25.6	25.5	3.3	11.8	14.3	1.3	5.7	10.6	2.8	11.7	17.7	12.5	18.5	20.1
Health worse now than before deployed	na	22.3	26.4	na	11.8	13.1	na	8.4	8.3	na	15.1	18.8	na	17.6	20.1
Exposure concerns	na	19.9	20.4	na	19.1	19.8	na	11.8	14.7	na	13.7	21.4	na	17.2	19.2
PTSD symptoms (2 or more)	na	8.6	12.3	na	5.2	6.9	na	2.5	2.4	na	5.7	8.8	na	6.7	9.1
Depression symptoms (any)	na	30.6	32.9	na	22.1	23.4	na	13.1	13.6	na	25.6	29.9	na	25.4	27.4
Referral indicated by provider (any)	5.0	34.7	24.7	4.6	21.7	17.1	1.8	11.6	7.0	3.8	18.7	28.3	4.1	26.7	20.7
Mental health referral indicated[a]	1.1	6.9	10.3	0.6	2.9	5.9	0.5	1.5	1.9	0.3	1.6	4.9	0.8	4.8	7.2
Medical visit following referral[b]	92.2	99.8	98.4	84.6	92.6	92.8	86.5	96.7	98.2	45.0	80.8	93.8	83.6	97.5	96.9

	Army			Navy			Air Force			Marine Corps			All service members		
Reserve component	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900
	n= 72,176	n= 82,368	n= 54,789	n= 5,740	n= 3,971	n= 5,666	n= 16,291	n= 15,201	n= 16,378	n= 3,713	n= 4,377	n= 7,142	n= 97,920	n= 105,917	n= 83,975
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
General health "fair" or "poor"	1.3	11.9	16.5	0.5	10.1	9.0	0.3	4.9	5.0	0.9	7.6	11.3	1.1	10.6	13.3
Health concerns, not wound or injury	20.5	34.5	42.5	1.3	32.7	31.2	0.6	8.8	14.7	3.1	22.9	36.3	15.4	30.2	35.8
Health worse now than before deployed	na	26.6	31.7	na	20.7	20.5	na	12.9	11.0	na	21.1	27.4	na	24.2	26.5
Exposure concerns	na	33.5	32.7	na	42.6	34.4	na	19.6	22.8	na	14.6	32.8	na	31.1	30.9
PTSD symptoms (2 or more)	na	8.8	18.3	na	6.2	11.7	na	2.5	2.8	na	4.1	13.4	na	7.6	14.4
Depression symptoms (any)	na	31.2	33.9	na	26.6	23.9	na	14.7	13.2	na	30.9	28.5	na	28.7	28.7
Referral indicated by provider (any)	3.8	36.4	34.6	3.7	28.3	20.4	0.5	14.4	6.7	4.0	27.8	31.5	3.3	32.6	27.9
Mental health referral indicated[a]	0.4	4.9	12.2	0.2	2.6	5.8	0.1	0.9	0.9	0.1	2.1	10.3	0.3	4.1	9.4
Medical visit following referral[b]	92.0	99.0	38.3	96.4	98.1	42.5	54.5	66.5	42.2	39.1	71.4	30.6	85.9	96.2	38.1

[a]Includes behavioral health, combat stress and substance abuse referrals.
[b]Record of inpatient or outpatient visit within 6 months after referral.

Figure 3. Proportion of service members who endorsed exposure concerns on post-deployment health assessments, U.S. Armed Forces, January 2004-May 2010



Sentinel reportable events among service members and beneficiaries at U.S. Army medical facilities, cumulative numbers[a] for calendar years through 31 May 2009 and 31 May 2010

Army

Reporting locations	Number of reports all events[b]		Food-borne						Vaccine preventable					
			Campylo-bacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella[c]	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
NORTHERN														
Aberdeen Proving Ground, MD	3	23	.	.	.	.	.	.	.	.	.	.	.	.
Fort Belvoir, VA	107	106	4	3	2	.	.	2	.	.	.	.	.	.
Fort Bragg, NC	720	618	2	.	5	3	.	.	.	.	2	.	.	.
Fort Dix, NJ	0	0	.	.	.	.	.	.	.	.	.	.	.	.
Fort Drum, NY	22	15	.	.	.	.	.	.	.	.	.	.	.	.
Fort Eustis, VA	103	97	.	.	.	.	.	.	.	.	.	.	.	.
Fort George G Meade, MD	24	8	.	.	.	.	.	.	.	.	.	.	.	.
Fort Knox, KY	79	144	.	.	.	1	.	2	.	.	.	.	.	1
Fort Lee, VA	255	216	.	.	.	.	.	.	.	.	.	.	.	.
Fort Monmouth, NJ	27	20	.	.	.	.	.	.	.	.	.	1	.	.
Walter Reed AMC, DC	79	73	1	.	.	3	.	.	.	.	1	.	1	.
West Point Military Reservation, NY	32	26	1	.	.	.	.	.	.	.	1	.	.	.
SOUTHERN														
Fort Benning, GA	93	5	.	.	.	.	1	.	.	.	.	.	.	.
Fort Campbell, KY	120	314	.	.	.	.	.	.	.	.	.	.	.	.
Fort Gordon, GA	306	321	.	2	3	3	1	1	.	.	.	.	1	.
Fort Hood, TX	789	950	6	3	9	3	4	27	.	.	.	1	.	.
Fort Jackson, SC	142	155	.	.	.	.	.	.	.	.	.	.	.	.
Fort Polk, LA	197	187	.	.	.	.	.	3	.	.	.	.	.	.
Fort Rucker, AL	38	42	7	.	1	.	.	.	.	.	.	1	.	.
Fort Sam Houston, TX	262	203	1	.	2	1	.	.	.	.	.	.	.	.
Fort Sill, OK	109	185	.	.	.	.	2	1	.	.	.	.	.	.
Fort Stewart, GA	488	253	.	1	4	2	7	3	.	.	.	1	.	.
WESTERN														
Fort Bliss, TX	214	235	.	3	1	2	1	1	1	.	5	3	.	.
Fort Carson, CO	317	321	1	3	.	1	.	.	.	.	.	.	.	.
Fort Huachuca, AZ	36	39	.	.	.	2	.	.	.	.	.	.	.	.
Fort Leavenworth, KS	22	17	.	.	.	.	.	.	.	.	.	.	.	.
Fort Leonard Wood, MO	181	160	.	.	.	2	.	.	1	.	.	.	1	.
Fort Lewis, WA	486	333	1	4	2	1	.	.	.	.	.	.	.	.
Fort Riley, KS	214	160	.	.	2	1	.	1	.	.	.	.	.	.
Fort Wainwright, AK	89	130	.	.	.	.	.	.	.	.	.	.	.	.
NTC and Fort Irwin, CA	52	45	.	.	.	.	1	.	.	.	.	.	.	.
PACIFIC														
Hawaii	297	362	12	12	5	9	.	3	.	1	1	.	.	.
Japan	3	0	.	.	.	.	.	.	.	.	.	.	.	.
Korea	221	163	.	.	.	.	.	.	.	.	.	.	.	.
EUROPEAN														
Heidelberg	45	73	3	5	1	4	.	1	.	.	.	.	.	.
Landstuhl	314	183	2	2	2	.	.	2	.	.	1	2	1	.
Bavaria	208	122	4	1	2	.	.	.	.	.	.	.	.	.
CENTCOM LOCATIONS														
CENTCOM	70	82	.	.	.	.	.	.	.	.	.	.	.	.
Total	**6,764**	**6,386**	**45**	**39**	**41**	**38**	**17**	**47**	**2**	**1**	**11**	**9**	**4**	**1**

[a]Events reported by June 8, 2009 and 2010
[b]Sixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.
[c]Service member cases only.
Note: Completeness and timeliness of reporting vary by facility.

Sentinel reportable events among service members and beneficiaries at U.S. Army medical facilities, cumulative numbers[a] for calendar years through 31 May 2009 and 31 May 2010


Army

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold[c]		Heat[c]		Q Fever		Tuberculosis	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
NORTHERN																		
Aberdeen Proving Ground, MD	.	.	.	.	2	19	1	4	.	.	.	.	.	.	.	.	.	.
Fort Belvoir, VA	.	.	.	.	90	91	11	10	.	.	.	.	.	.	.	.	.	.
Fort Bragg, NC	.	.	.	4	596	498	102	93	2	1	.	8	11	11	.	.	.	.
Fort Dix, NJ	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fort Drum, NY	.	.	.	.	19	13	3	2	.	.	.	.	.	.	.	.	.	.
Fort Eustis, VA	.	.	.	.	88	87	15	8	.	2	.	.	.	.	.	.	.	.
Fort George G Meade, MD	.	.	.	.	24	5	.	3	.	.	.	.	.	.	.	.	.	.
Fort Knox, KY	1	.	.	1	67	132	11	6	.	.	.	.	.	.	.	.	.	1
Fort Lee, VA	1	.	.	.	228	193	24	23	2	.	.	.	.	.	.	.	.	.
Fort Monmouth, NJ	5	11	.	.	20	7	1	.	1	1	.	.	.	.	.	.	.	.
Walter Reed AMC, DC	4	2	.	.	55	57	7	9	9	1	.	.	.	.	.	.	1	1
West Point Military Reservation, NY	6	5	.	.	23	18	1	3	.	.	.	.	.	.	.	.	.	.
SOUTHERN																		
Fort Benning, GA	.	.	5	.	68	.	18	.	1	.	.	.	.	5	.	.	.	.
Fort Campbell, KY	4	.	.	.	89	290	18	22	1	.	.	.	8	2	.	.	.	.
Fort Gordon, GA	.	.	.	.	257	266	43	49	.	.	.	.	1	.	.	.	.	.
Fort Hood, TX	.	.	.	1	620	749	146	162	3	3	.	.	.	.	.	.	1	1
Fort Jackson, SC	.	.	.	.	101	101	19	18	.	.	.	8	22	28	.	.	.	.
Fort Polk, LA	.	.	.	.	171	149	19	21	1	.	.	.	6	14	.	.	.	.
Fort Rucker, AL	.	.	.	.	28	41	2	.	.	.	.	.	.	.	.	.	.	.
Fort Sam Houston, TX	.	.	.	.	210	177	37	17	8	8	.	.	4	.	.	.	.	.
Fort Sill, OK	.	.	.	.	93	163	14	20	.	1	.	.	.	.	.	.	.	.
Fort Stewart, GA	.	.	.	.	391	218	71	28	4	.	.	.	5	.	6	.	.	.
WESTERN																		
Fort Bliss, TX	.	.	.	.	171	196	29	27	5	2	.	.	.	.	.	.	1	1
Fort Carson, CO	.	.	.	.	285	297	31	20	.	.	.	.	.	.	.	.	.	.
Fort Huachuca, AZ	.	1	.	.	34	35	2	1	.	.	.	.	.	.	.	.	.	.
Fort Leavenworth, KS	.	1	.	.	17	15	3	.	1	1	.	.	1	.	.	.	.	.
Fort Leonard Wood, MO	.	.	.	.	161	137	17	19	.	.	1	.	.	2	.	.	.	.
Fort Lewis, WA	.	.	.	.	437	305	45	21	1	1	.	.	.	.	.	.	.	1
Fort Riley, KS	.	.	.	.	179	150	32	8	.	.	1	.	.	.	.	.	.	.
Fort Wainwright, AK	.	.	.	.	82	118	6	3	.	.	1	9	.	.	.	.	.	.
NTC and Fort Irwin, CA	.	.	.	.	50	43	1	2	.	.	.	.	.	.	.	.	.	.
PACIFIC																		
Hawaii	.	.	.	.	245	305	27	30	1	2	.	.	.	.	1	.	5	.
Japan	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.
Korea	.	.	.	2	211	144	6	9	2	.	1	8	1	.	.	.	.	.
EUROPEAN																		
Heidelberg	3	1	.	.	34	53	4	8	.	1	.	.	.	.	.	.	.	.
Landstuhl	10	3	.	4	254	142	32	27	7	.	.	.	3	.	.	.	2	1
Bavaria	4	2	3	.	179	99	15	19	.	1	1	.	.	.	.	.	.	.
CENTCOM LOCATIONS																		
CENTCOM	.	.	.	.	63	75	6	7	1	.	.	.	.	.	.	.	.	.
Total	**38**	**26**	**8**	**12**	**5,645**	**5,388**	**819**	**699**	**50**	**25**	**5**	**33**	**62**	**62**	**7**	**0**	**10**	**6**

Sentinel reportable events among service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers[a] for calendar years through 31 May 2009 and 31 May 2010

Navy

Reporting locations	Number of reports all events[b]		Food-borne						Vaccine preventable					
			Campylo-bacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella[c]	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
NATIONAL CAPITOL AREA														
NNMC Bethesda, MD	64	69	.	3	1	.	.	2	.	.	.	6	.	.
NHC Annapolis, MD	2	9	.	.	.	.	.	.	.	.	.	.	.	.
NHC Patuxent River, MD	15	2	.	.	.	.	.	.	.	.	.	.	.	.
NHC Quantico, VA	49	30	1	.	1	.	2	.	.	.	.	1	.	.
NAVY MEDICINE EAST														
NH Beaufort, SC	259	65	.	.	.	.	.	.	1	.	2	.	.	.
NH Camp Lejeune, NC	234	233	.	.	3	2	1	1	.	.	.	1	.	.
NH Charleston, SC	3	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Cherry Point, NC	3	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Corpus Christi, TX	0	4	.	.	.	.	.	.	.	.	.	.	.	.
NHC Great Lakes, IL	47	274	.	.	.	.	.	.	.	.	.	3	.	1
NH Guantanamo Bay, Cuba	0	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Jacksonville, FL	122	86	.	2	4	5	1	.	.	.	.	4	.	.
NH Naples, Italy	1	0	.	.	.	.	.	.	.	.	.	.	.	.
NHC New England, RI	0	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Pensacola, FL	79	49	1	.	1	2	2	.	.	.	.	.	.	.
NMC Portsmouth, VA	79	114	.	.	.	1	.	.	.	.	1	2	.	.
NH Rota, Spain	0	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Sigonella, Italy	1	0	.	.	.	.	.	.	.	.	.	.	1	.
NAVY MEDICINE WEST														
NH Bremerton, WA	2	3	.	.	.	.	.	.	.	.	.	1	.	.
NH Camp Pendleton, CA	6	1	.	.	.	.	.	.	.	.	.	.	.	.
NH Guam-Agana, Guam	25	29	.	.	2	.	.	.	.	.	.	.	.	.
NHC Hawaii, HI	3	311	.	5	.	3	.	.	.	.	.	.	.	.
NH Lemoore, CA	32	2	.	.	.	.	.	.	.	.	.	.	.	.
NH Oak Harbor, WA	55	29	3	.	2	.	.	.	.	.	1	1	1	.
NH Okinawa, Japan	38	57	.	.	.	.	.	.	.	.	.	.	.	.
NMC San Diego, CA	380	363	.	5	4	4	.	2	.	.	29	14	1	.
NH Twentynine Palms, CA	1	1	.	.	.	.	.	.	.	.	.	.	.	.
NH Yokosuka, Japan	29	28	.	.	.	.	.	.	.	.	3	1	.	.
NAVAL SHIPS														
COMNAVAIRLANT/CINCLANTFLEET	17	14	.	.	.	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	35	22	.	.	.	.	.	.	.	.	.	.	.	.
OTHER LOCATIONS														
Other	1,886	1,289	6	7	7	1	2	.	1	.	7	16	1	1
Total	**3,467**	**3,084**	**11**	**22**	**25**	**18**	**8**	**5**	**2**	**0**	**43**	**50**	**4**	**2**

[a]Events reported by June 8, 2010
[b]Sixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.
[c]Service member cases only.
Note: Completeness and timeliness of reporting vary by facility.

Sentinel reportable events among service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers[a] for calendar years through 31 May 2009 and 31 May 2010

Navy

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold[c]		Heat[c]		Q Fever		Tuberculosis	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
NATIONAL CAPITOL AREA																		
NNMC Bethesda, MD	1	4	.	1	57	38	4	4	1	10	.	.	.	.	.	1	.	.
NHC Annapolis, MD	.	1	.	.	2	8	.	.	.	.	.	.	.	.	.	.	.	.
NHC Patuxent River, MD	1	.	.	.	13	1	1	1	.	.	.	.	.	.	.	.	.	.
NHC Quantico, VA	.	1	.	.	39	19	5	2	.	.	.	6	1	1	.	.	.	.
NAVY MEDICINE EAST																		
NH Beaufort, SC	.	.	.	.	244	59	11	6	1	.	.	.	.	.	.	.	.	.
NH Camp Lejeune, NC	3	4	1	2	181	190	33	28	.	.	1	2	11	3	.	.	.	.
NH Charleston, SC	.	.	.	.	2	.	1	.	.	.	.	.	.	.	.	.	.	.
NH Cherry Point, NC	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Corpus Christi, TX	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.
NHC Great Lakes, IL	.	.	.	.	44	241	3	28	.	.	.	.	.	1	.	.	.	.
NH Guantanamo Bay, Cuba	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Jacksonville, FL	.	.	.	.	107	67	10	4	.	1	.	.	.	2	.	.	.	1
NH Naples, Italy	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
NHC New England, RI	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Pensacola, FL	.	.	.	.	67	38	5	7	1	2	.	.	.	.	2	.	.	.
NMC Portsmouth, VA	.	1	.	2	62	89	14	12	.	6	.	.	.	.	.	.	2	1
NH Rota, Spain	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Sigonella, Italy	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NAVY MEDICINE WEST																		
NH Bremerton, WA	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.
NH Camp Pendleton, CA	.	.	.	.	6	1	.	.	.	.	.	.	.	.	.	.	.	.
NH Guam-Agana, Guam	.	.	.	.	21	27	2	2	.	.	.	.	.	.	.	.	.	.
NHC Hawaii, HI	.	.	.	.	3	270	.	32	.	1	.	.	.	.	.	.	.	.
NH Lemoore, CA	.	.	.	.	31	.	1	2	.	.	.	.	.	.	.	.	.	.
NH Oak Harbor, WA	1	.	.	.	47	24	.	2	.	1	.	1	.	.	.	.	.	.
NH Okinawa, Japan	.	.	.	1	38	46	.	5	.	.	.	.	.	4	.	.	.	1
NMC San Diego, CA	.	1	3	1	280	292	46	35	9	4	.	.	4	5	2	.	2	.
NH Twentynine Palms, CA	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.
NH Yokosuka, Japan	1	.	.	.	25	25	.	1	.	1	.	.	.	.	.	.	.	.
NAVAL SHIPS																		
COMNAVAIRLANT/CINCLANTFLEET	.	.	.	.	17	12	.	2	.	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	.	.	.	.	33	20	2	2	.	.	.	.	.	.	.	.	.	.
OTHER LOCATIONS																		
Other	10	13	4	14	1,606	1,109	192	106	7	11	9	3	32	6	.	.	2	2
Total	**17**	**25**	**8**	**21**	**2,931**	**2,583**	**330**	**281**	**20**	**37**	**10**	**12**	**48**	**22**	**4**	**1**	**6**	**5**

Sentinel reportable events among service members and beneficiaries at U.S. Air Force medical facilities, cumulative numbers[a] for calendar years through 31 May 2009 and 31 May 2010

Air Force

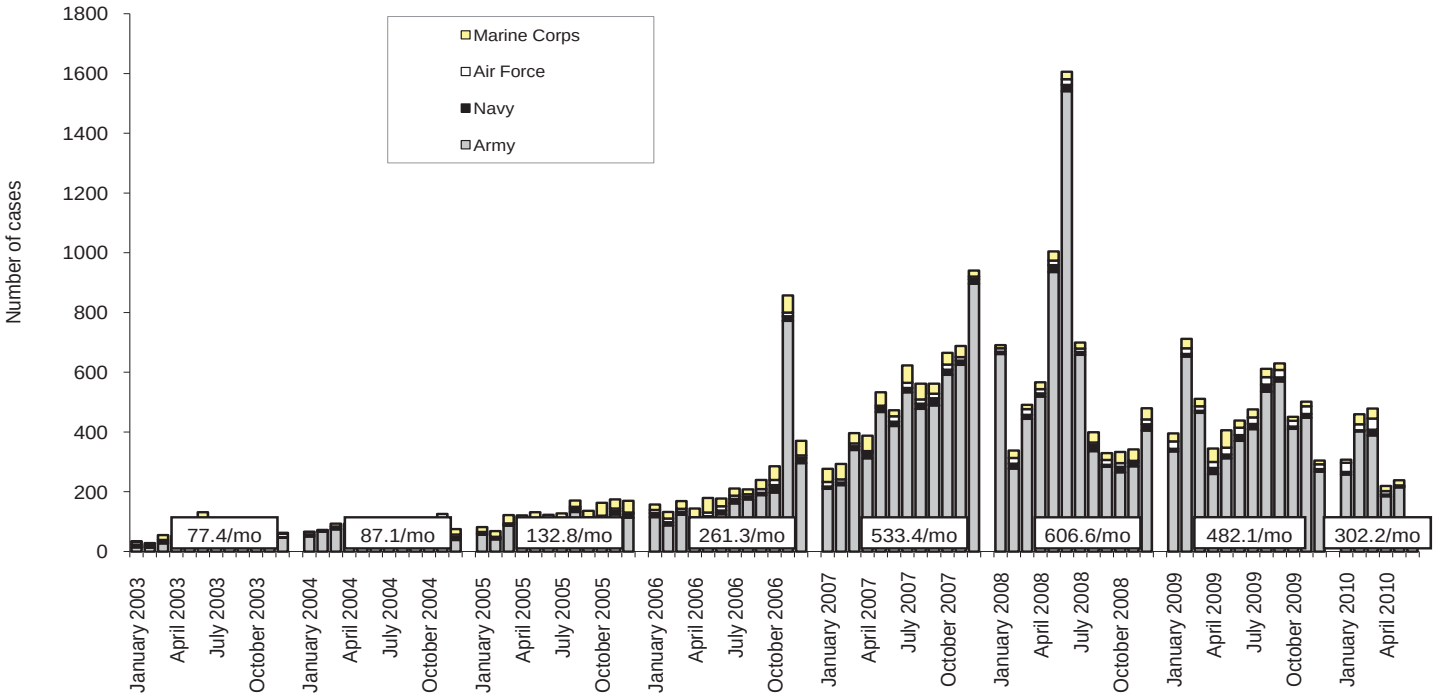
Reporting locations	Number of reports all events[b]		Food-borne						Vaccine preventable					
			Campylo-bacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella[c]	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Air Combat Cmd	606	708	2	2	5	5	1	2	.	1	1	9	2	2
Air Education & Training Cmd	648	622	4	3	11	1	2	1	3	2	4	8	.	1
Air Force Dist. of Washington	87	75	.	2	1	.	.	1	.	.	1	2	.	.
Air Force Materiel Cmd	236	223	1	2	3	6	.	.	.	.	3	.	.	.
Air Force Special Ops Cmd	82	81	1	.	1	4	.	1	.	.	.	1	.	.
Air Force Space Cmd	143	144	1	.	4	2	.	.	1	1	.	.	.	.
Air Mobility Cmd	370	261	4	2	4	1	2	.	.	1	4	2	1	.
Pacific Air Forces	227	384	1	1	3	3	.	3	.	.	4	2	2	1
U.S. Air Forces in Europe	244	231	3	1	1	2	.	.	.	.	3	.	1	2
U.S. Air Force Academy	27	30	.	.	1	1	.	.	.	.	.	2	.	.
Other	31	42	1	.	1	5	.	2	.	.	.	.	.	.
Total	**2,701**	**2,801**	**18**	**13**	**35**	**30**	**5**	**10**	**4**	**5**	**20**	**26**	**6**	**6**

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold[c]		Heat[c]		Q Fever		Tuberculosis	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Air Combat Cmd	5	1	.	.	535	608	47	69	3	4	5	3	.	1	.	.	.	1
Air Education & Training Cmd	1	.	.	2	551	546	65	54	3	3	3	.	1	.	.	.	.	1
Air Force Dist. of Washington	5	2	.	.	74	56	6	12	.	.	.	.	.	.	.	.	.	.
Air Force Materiel Cmd	4	1	.	.	201	187	22	24	2	1	.	.	.	2	.	.	.	.
Air Force Special Ops Cmd	1	.	.	.	74	70	3	3	1	1	1	1	.	.	.	.	.	.
Air Force Space Cmd	.	1	.	1	132	128	5	10	.	.	.	1	.	.	.	.	.	.
Air Mobility Cmd	9	5	.	1	297	224	33	22	2	1	14	2	.	.	.	.	.	.
Pacific Air Forces	.	.	.	1	188	348	18	23	2	1	9	.	.	.	.	.	.	1
U.S. Air Forces in Europe	2	1	1	2	215	202	15	20	1	.	1	.	.	.	.	.	1	1
U.S. Air Force Academy	.	.	.	.	25	27	1	.	.	.	.	.	.	.	.	.	.	.
Other	.	.	1	1	17	32	5	1	.	.	.	1	4	.	1	.	1	.
Total	**27**	**11**	**2**	**8**	**2,309**	**2,428**	**220**	**238**	**14**	**11**	**33**	**8**	**5**	**3**	**1**	**0**	**2**	**4**

[a]Events reported by June 8, 2010
[b]Sixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.
[c]Service member cases only.
Note: Completeness and timeliness of reporting vary by facility.

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - June 2010 (data as of 2 July 2010)

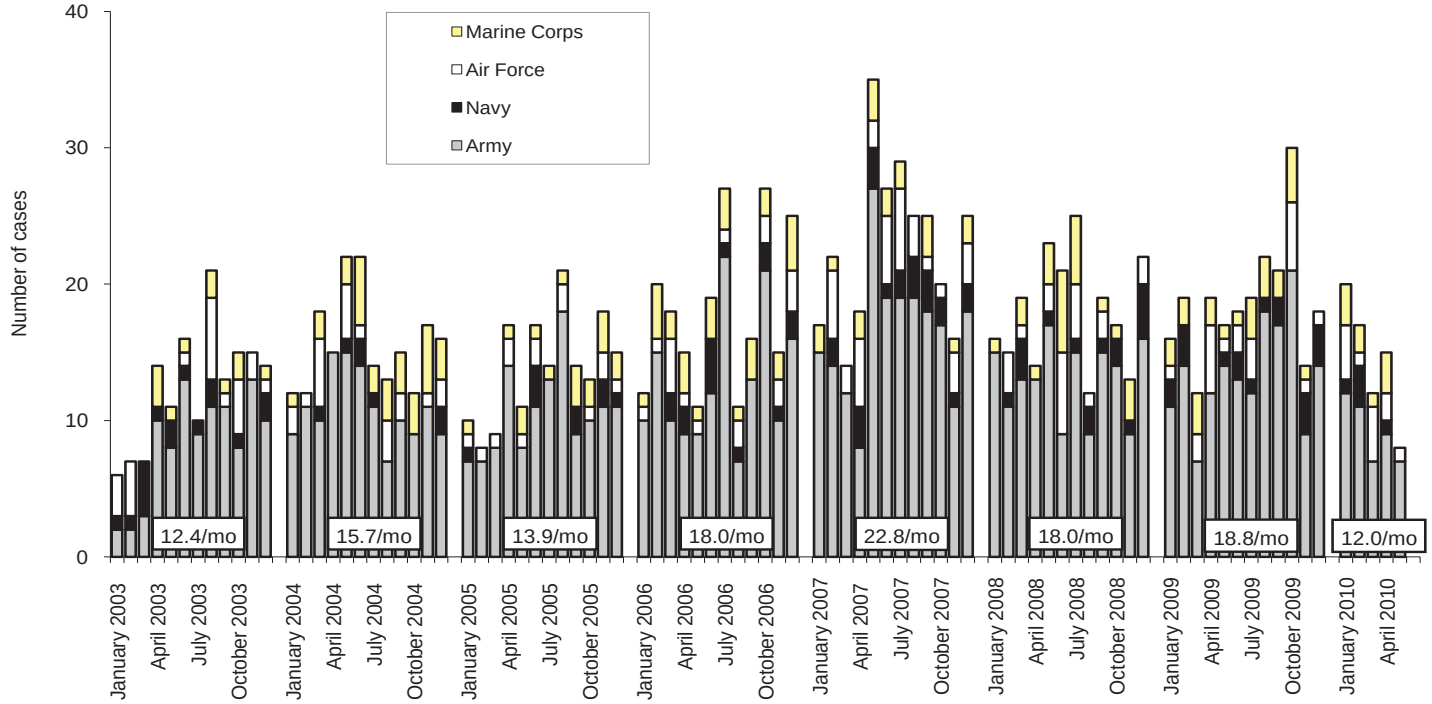
Traumatic brain injury (ICD-9: 310.2, 800-801, 803-804, 850-854, 907.0, 950.1-950.3, 959.01, V15.5_1-9, V15.5_A-F, V15.59_1-9, V15.59_A-F)[a]



Reference: Armed Forces Health Surveillance Center. Deriving case counts from medical encounter data: considerations when interpreting health surveillance reports. *MSMR*. Dec 2009; 16(12):2-8.

[a]Indicator diagnosis (one per individual) during a hospitalization or ambulatory visit while deployed to/within 30 days of returning from OEF/OIF. (Includes in-theater medical encounters from the Theater Medical Data Store [TMDS] and excludes 2,135 deployers who had at least one TBI-related medical encounter any time prior to OEF/OIF).

Deep vein thrombophlebitis/pulmonary embolus (ICD-9: 415.1, 451.1, 451.81, 451.83, 451.89, 453.2, 453.40 - 453.42 and 453.8)[b]

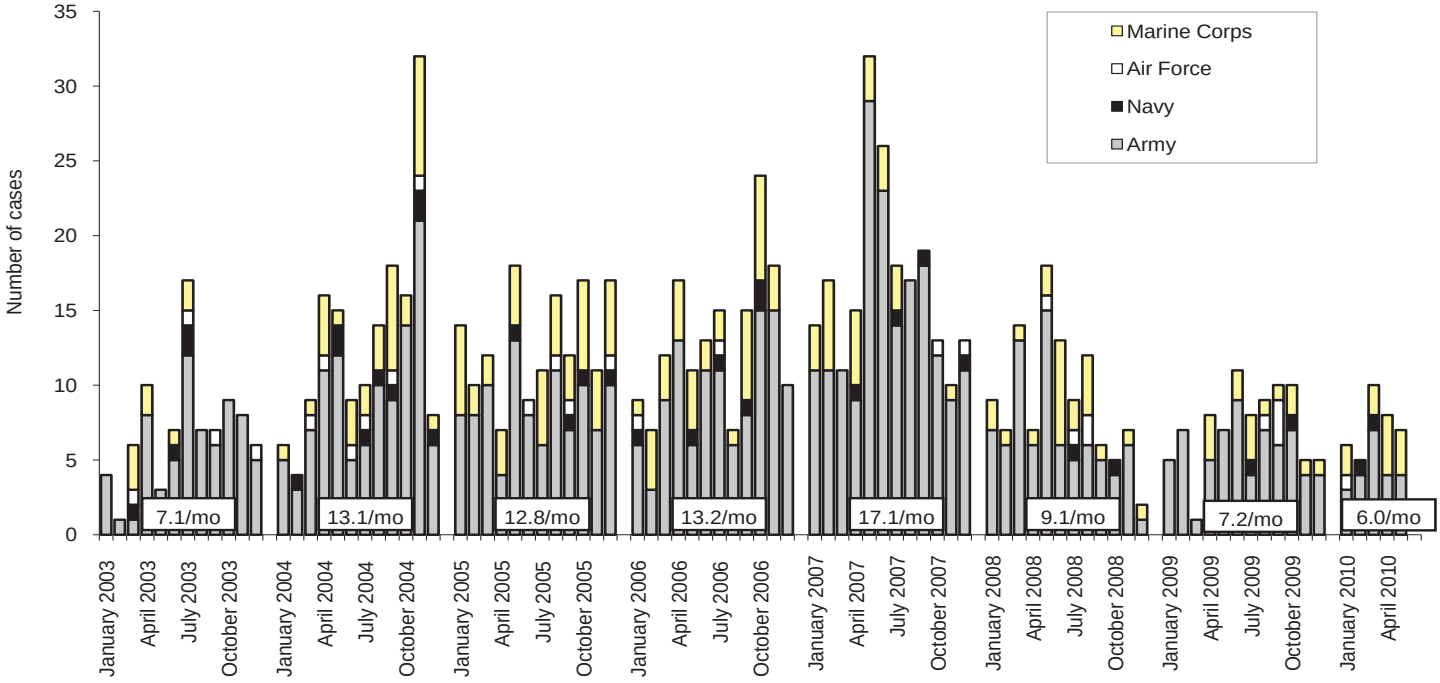


Reference: Isenbarger DW, Atwood JE, Scott PT, et al. Venous thromboembolism among United States soldiers deployed to Southwest Asia. *Thromb Res*. 2006;117(4):379-83.

[b]One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 90 days of returning from OEF/OIF.

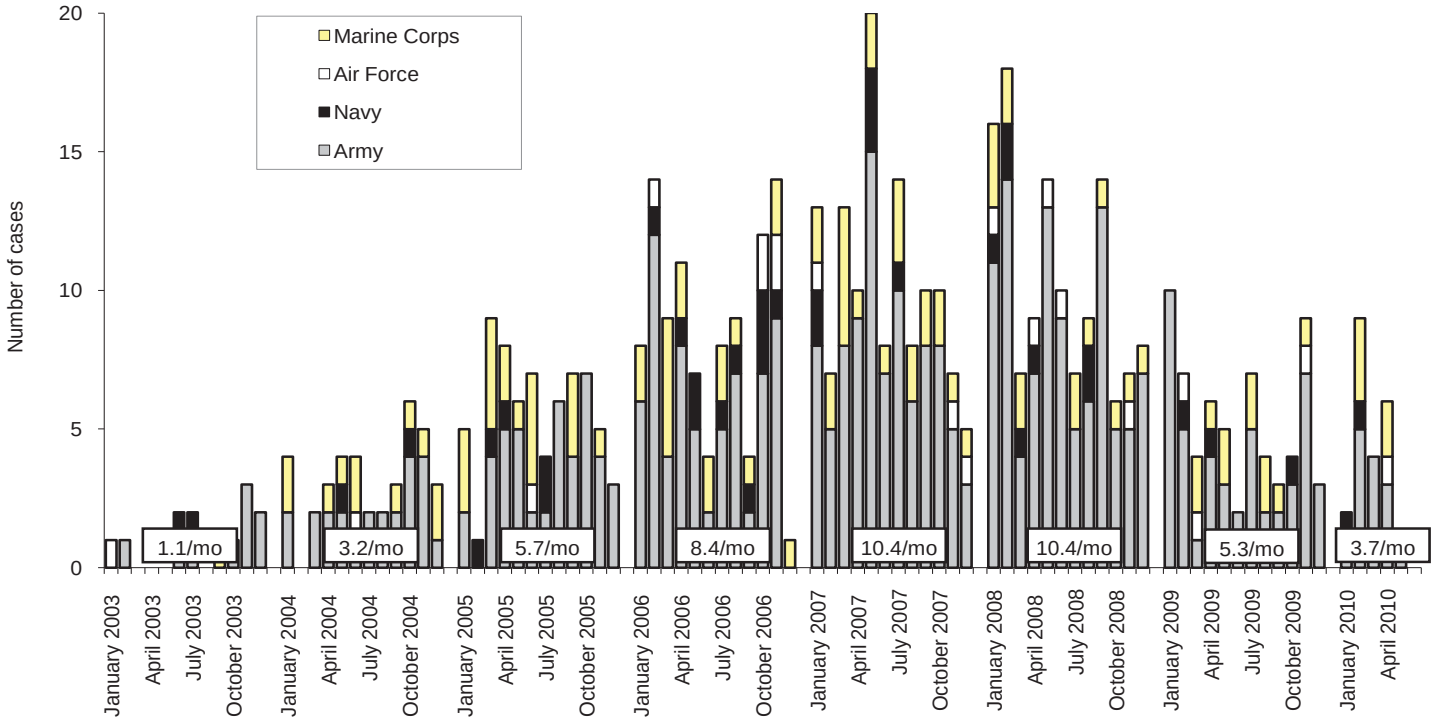
Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - June 2010 (data as of 2 July 2010)

Amputations (ICD-9: 887, 896, 897, V49.6 except V49.61-V49.62, V49.7 except V49.71-V49.72, PR 84.0-PR 84.1, except PR 84.01-PR 84.02 and PR 84.11)[a]



Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: amputations. Amputations of lower and upper extremities, U.S. Armed Forces, 1990-2004. *MSMR*. Jan 2005;11(1):2-6.
[a]Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 365 days of returning from OEF/OIF.

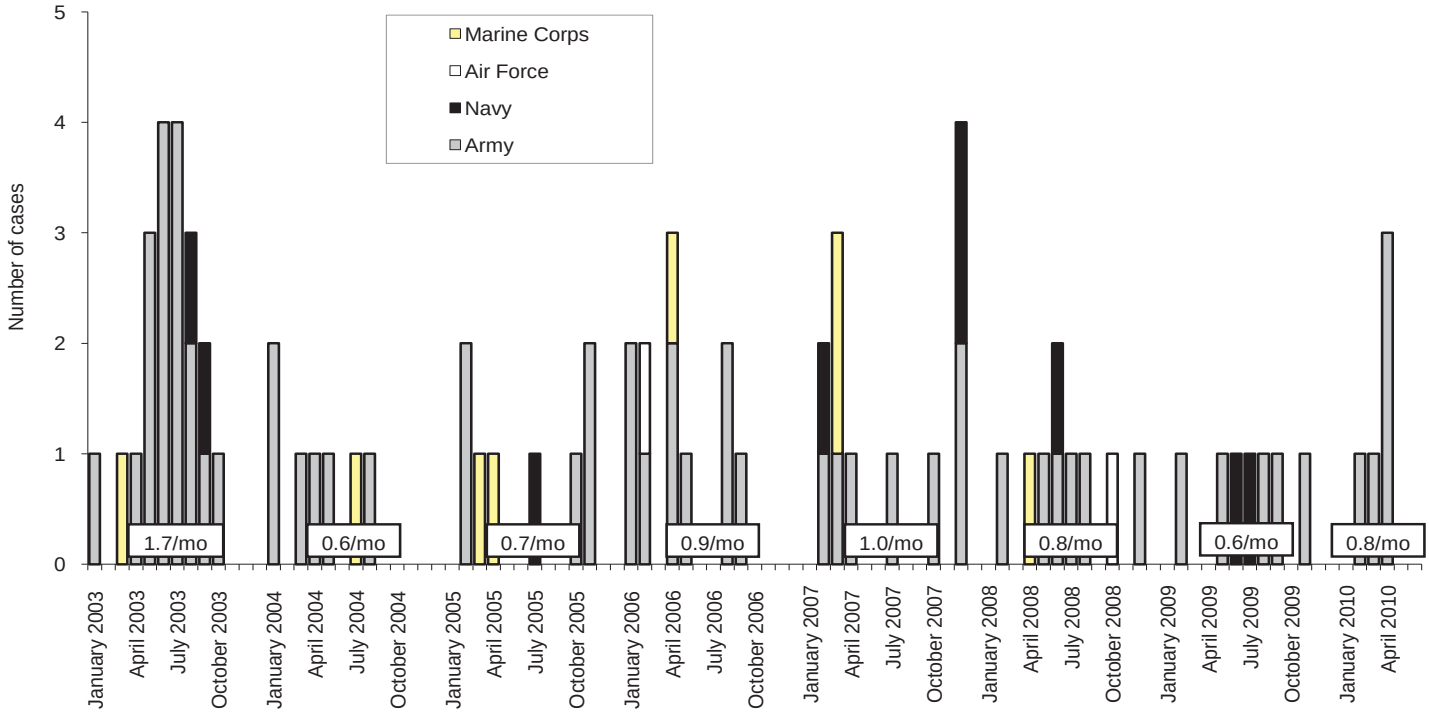
Heterotopic ossification (ICD-9: 728.12, 728.13, 728.19)[b]



Reference: Army Medical Surveillance Activity. Heterotopic ossification, active components, U.S. Armed Forces, 2002-2007. *MSMR*. Aug 2007; 14(5):7-9.
[b]One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 365 days of returning from OEF/OIF.

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - June 2010 (data as of 2 July 2010)

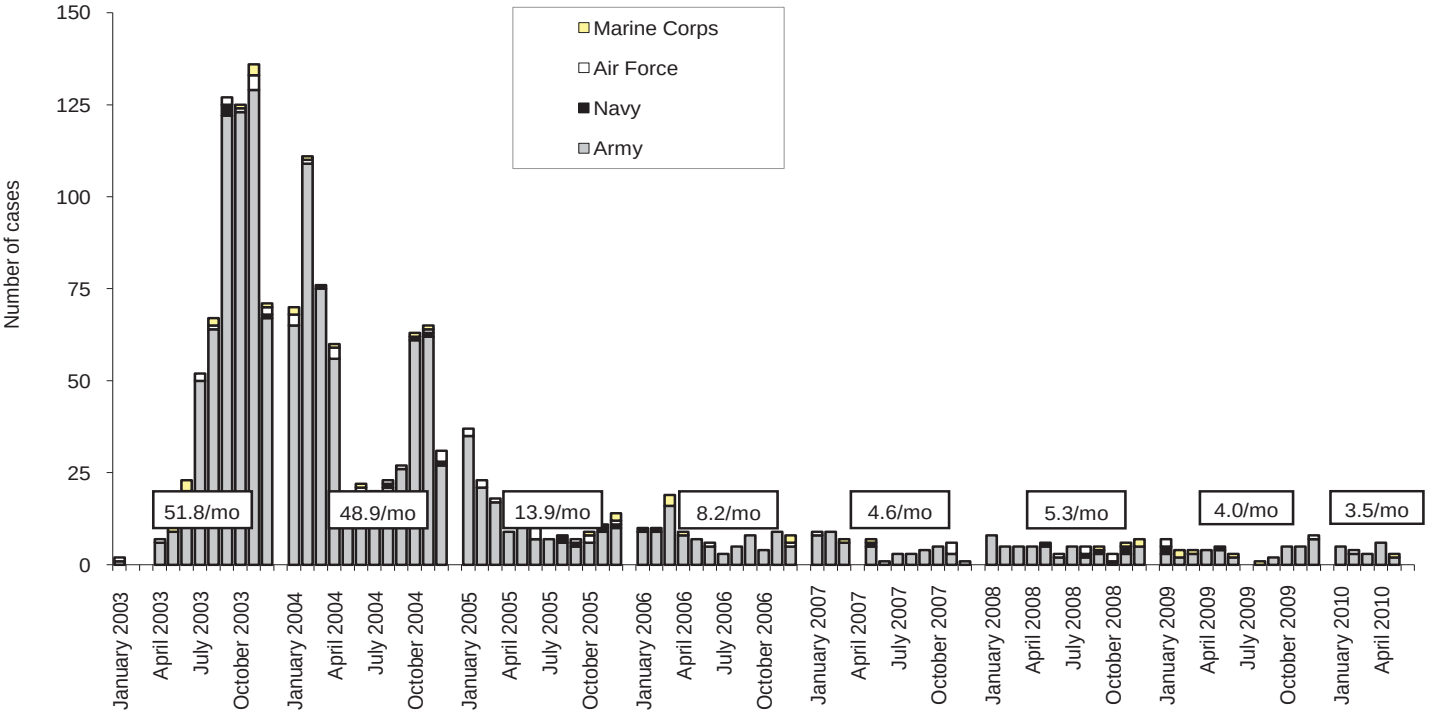
Severe acute pneumonia (ICD-9: 518.81, 518.82, 480-487, 786.09)[a]



Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: severe acute pneumonia. Hospitalizations for acute respiratory failure (ARF)/acute respiratory distress syndrome (ARDS) among participants in Operation Enduring Freedom/Operation Iraqi Freedom, active components, U.S. Armed Forces, January 2003-November 2004. *MSMR*. Nov/Dec 2004;10(6):6-7.

[a]Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

Leishmaniasis (ICD-9: 085.0 to 085.9)[b]



Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: leishmaniasis. Leishmaniasis among U.S. Armed Forces, January 2003-November 2004. *MSMR*. Nov/Dec 2004;10(6):2-4.

[b]Indicator diagnosis (one per individual) during a hospitalization, ambulatory visit, and/or from a notifiable medical event during/after service in OEF/OIF.

Commander
U.S. Army Public Health Command (Provisional)
ATTN: MCHB-TS-EDM
5158 Blackhawk Road
Aberdeen Proving Ground, MD 21010-5422

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